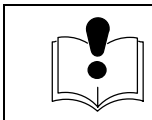
# INSTRUCTIONS-PARTS LIST 310559

Rev. B



**This manual contains important warnings and information.**
**READ AND KEEP IT FOR REFERENCE.**

INSTRUCTIONS

GRACO

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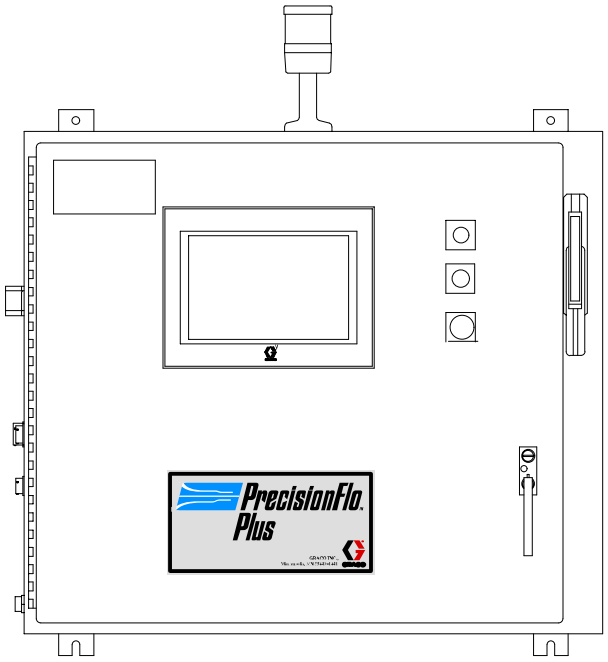
**PrecisionFlo Plus™ Control Assembly**

# TouchScreen Operator's Guide




8369A

Single Application Control Assembly

***Part No. 918640***

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**GRACO INC. P.O. BOX 1441 MINNEAPOLIS, MN 55440–1441**


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# About This Guide

## Purpose

This manual describes how to use the TouchScreen software program, which is a series of user screens and buttons that change the operating state of the PrecisionFlo Plus control assembly. The manual provides a brief description of each screen and button in the TouchScreen program.

## Scope

The manual provides an overview of screen navigation and summary explanation of the PrecisionFlo Plus TouchScreen environment. It is intended as a supplement to Graco manual #310558, which explains the setup and configuration of the entire PrecisionFlo Plus system.

The TouchScreen application is the Graphical User Interface (GUI) to the PrecisionFlo Plus system. The TouchScreen does not perform the low-level functions that control the system, it is simply the means by which the operator communicates with the PrecisionFlo Plus Module which is the controller that performs these functions. The PrecisionFlo Plus module is physically mounted inside the control enclosure. The TouchScreen's primary functions are to accept operator input to adjust system parameters and to provide system status to the operator.

## Audience

This manual covers basic information for users who have no, or limited previous experience using the TouchScreen display. Users who are familiar with other touchscreen programs will find this program easy to use.

## How to Use TouchScreen

If you are new to TouchScreen, this manual describes how to use:

- the scroll bar to page up and page down
- the control buttons and screens to set up operations
- the numeric and alpha-numeric keypads to enter data

## Organization

This manual provides information for the five TouchScreen navigation control buttons. The user is presented a screen-by-screen development of the screens, control buttons, and data areas. This method is very effective in helping the operator learn how to use the program. The manual can also be used for reference and training purposes.

In several places throughout this manual, the explanation will reference a specific screen. In these situations the sequence of buttons to be touched to display the screen will be shown in the following format:

**Button1 → Button2 → Button3**

To display the screen being discussed, you should touch button 1 on the current screen, button 2 on the next screen, and so on.

## Related Product Information

For additional information about the PrecisionFlo Plus Control Assembly, refer to the printed version of manual 310558.

# Using TouchScreen

## Starting and Exiting TouchScreen

### Starting TouchScreen

The TouchScreen display turns on when power is applied to the control assembly.

To start TouchScreen (Fig. 1):

1. Turn on air and electrical power to the system.
2. Turn on the main electrical disconnect (1) to supply power to the control assembly. Verify that the POWER ON light (2) is on.
3. The TouchScreen (3) display becomes active.

   If the TouchScreen display is unlit, refer to instruction manual 310558 for troubleshooting information and the service procedures.

### Exiting TouchScreen

The TouchScreen display turns off when power is removed from the control assembly.

To exit TouchScreen (Fig. 1):

1. Turn off the main electrical disconnect (1) to remove power from the control assembly. The TouchScreen (3) display becomes inactive.

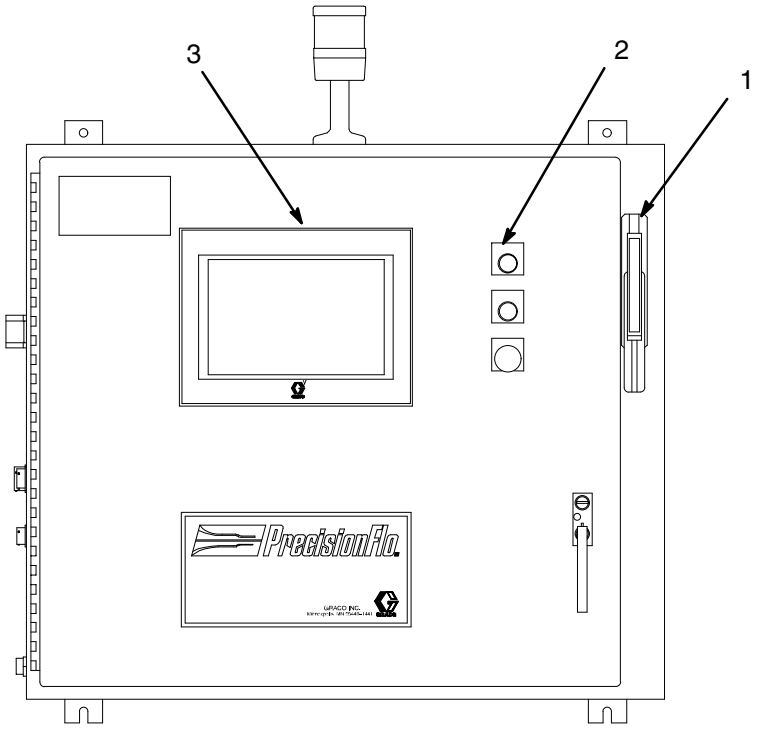


**Fig. 1**

# Using TouchScreen

## Using the Control Buttons

The control buttons are displayed on every screen except in the Setup data area. The control buttons are used to navigate through the TouchScreen program.

## Navigation Bar

The navigation bar and the fault status bar are shown in Fig. 2.

**NOTE:** A password is required to access certain screens within the TouchScreen application. The password is entered on the on-screen alphanumeric keypad (Fig. 5). Most password-protected screens are accessible using the user password, however, some screens require the “super user” password. These screens are used for application setup and configuration by authorized personnel and are not used in normal system operation. Contact your site system administrator to access these screens.

### Overview

The **Overview** button is used to access the overview screen, which provides a summary of system status.

### Setup

The **Setup** button is used to access the setup screens, most of which are password-protected. The operator uses the setup screens to set parameters for the metering valve, the dispense device, and the other components needed to operate the PrecisionFlo Plus module.

### Settings

The **Settings** button provides access to the password–protected Settings screen where the operator can select system operational modes, make adjustments to some dispensing parameters, and manually dispense material.

### Data

The **Data** button is used to access the data screen where the operator can view a brief summary of completed jobs.

### Alarms

The **Alarms** button allows the operator to view the alarms and warnings on the alarm screen.

### Help

The **Help** button is used to access the online instruction manual. The instruction manual contains detailed configuration, operation, and parts information as well as troubleshooting tables, service procedures, and schematic diagrams.

When an alarm or warning condition is active, the label on the Help button is the color of the Fault Status bar (yellow for alarms, red for warnings), and touching the Help button brings up the appropriate page of the online instruction manual.

## Fault Status Bar

**NOTE:** For the purposes of this manual, “fault” is defined as any abnormal operating condition. There are two categories of fault condition: alarms and warnings.

The Fault Status bar appears in one of three states: normal, alarm, or warning. If no alarm or warning is active, the Fault Status bar is green and the “No Alarms/Warnings Present” message is displayed. When the Fault Status bar is yellow, the system is experiencing a warning condition and the fault message is displayed. When the fault status bar is red, the system is experiencing an alarm condition and the applicable fault message is displayed.

When either an alarm or a warning is present, touching the Help button will open the online manual to a page with additional information pertaining to the current fault. If there is no specific reference to the current fault condition, touching Help will open the online manual to the Table of Contents.

When an alarm is present, the PrecisionFlo Plus Module will signal the robot controller to stop dispensing. The cause of the alarm must be cleared and the Reset button pressed before the system will return to normal operation. In contrast, a warning will not interrupt dispensing. Both conditions are entered in the Alarm Log.

### Reset

The **Reset** button is used to send a fault reset signal to the PrecisionFlo Plus Module and to acknowledge and clear alarms.

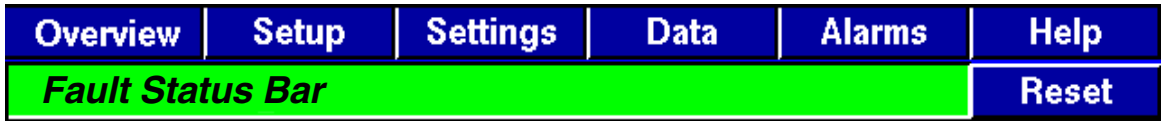


**Fig. 2**

# Using TouchScreen

### Back

When navigating the setup screens, the **Overview**, **Setup**, **Settings**, **Data**, and **Alarm** buttons are replaced by the **Back** button, as shown in Fig. 3. The **Back** button is used to return to the previously displayed screen.

**Fig. 3**

## System Tabs

The PrecisionFlo Plus TouchScreen is capable of interfacing with up to four PrecisionFlo Modules. If your system has been configured by Graco for multiple system operation, the TouchScreen application will display a system tab for each module across the top of the screen (Fig. 4). From anywhere in the TouchScreen application, touch any system tab to see that system's information for the current screen.

If a system not currently selected for viewing experiences a fault condition, the label on that system's tab will change to the corresponding color—red for alarm, yellow for warning. To see what the fault is, touch the system tab and read the Fault Status bar. All faults on all systems are entered in their respective Alarm logs.

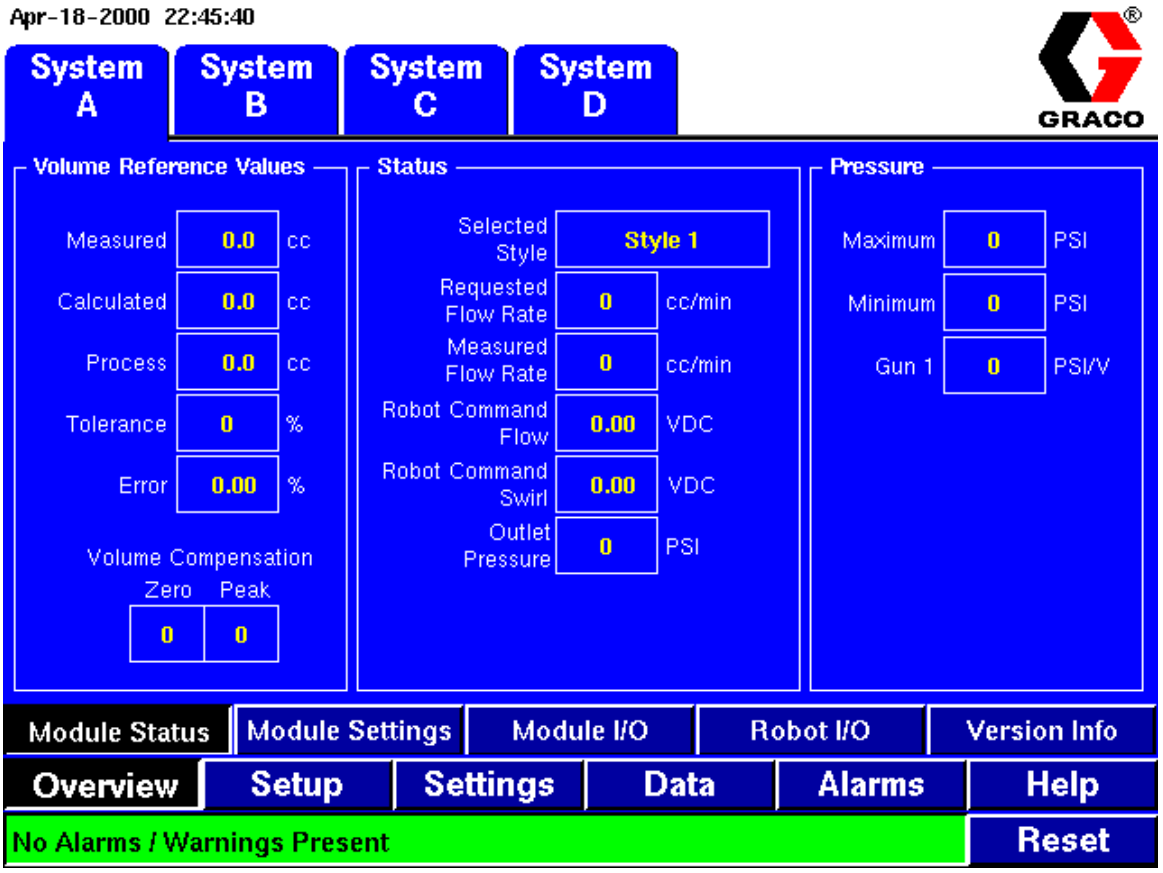


**Fig. 4**

# Using TouchScreen

## Entering the Password

Figure 5 shows the password keypad. This keypad appears whenever the operator attempts to access a password-protected screen.

For security, a user password is required to access certain screens such as the general setup, dispense parameters, and settings screens.

In addition, a “super user” password is required to access screens that require in-depth knowledge of the system to configure correctly. It is not necessary to access these screens for normal system operation. Contact your site system administrator to access these screens.

This system does not shut down when an incorrect password is entered.

The operator must touch **Accept** for the system to accept the password entered on the keypad.

Touch **Cancel** to cancel the password keypad. Touch **Space** to leave a space before the next character entered. The **<—** key is the backspace key. Each character entered on the password keypad is represented on the screen by an asterisk (*). For example, Graco appears on the character screen as: *****

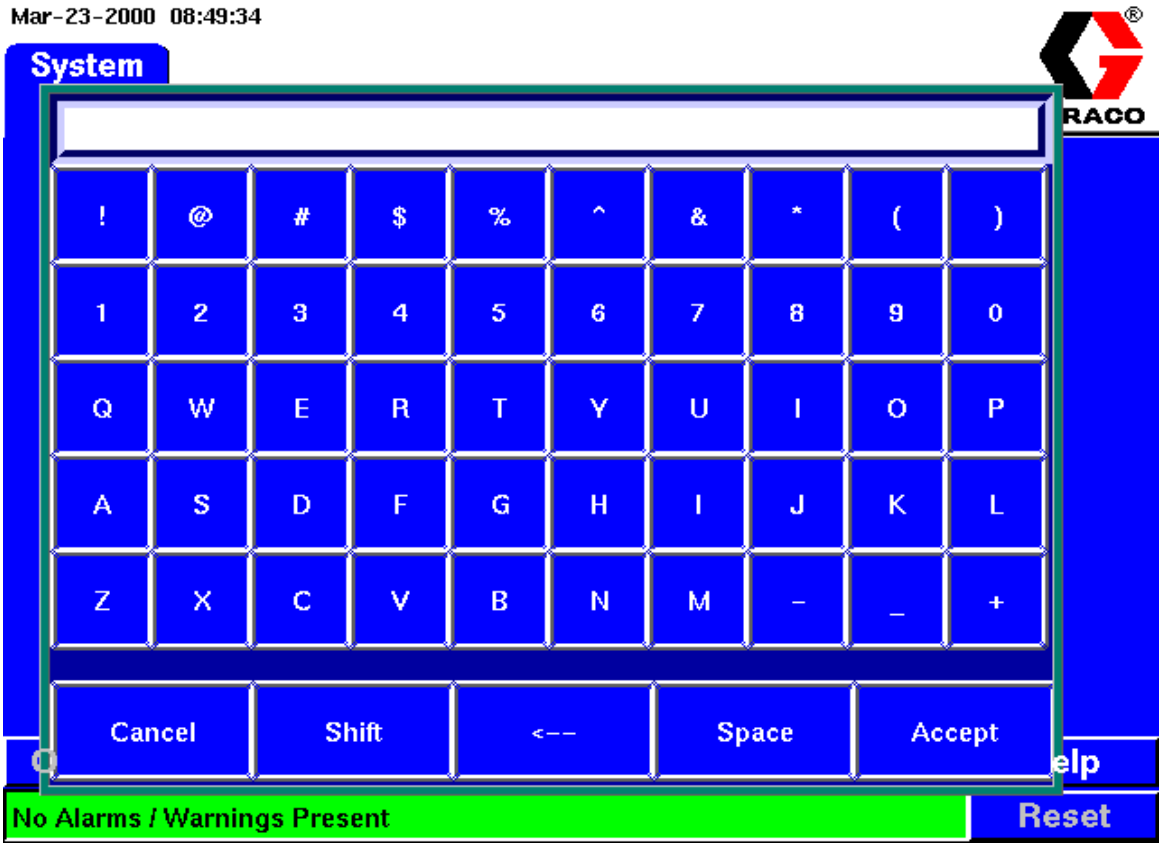
Mar-23-2000 08:49:34
System
RACO
! @ # $ % ^ & * ( )
1 2 3 4 5 6 7 8 9 0
Q W E R T Y U I O P
A S D F G H I J K L
Z X C V B N M - _ +
Cancel
Shift
<--
Space
Accept
elp
No Alarms / Warnings Present
Reset

**Fig. 5**

# Using TouchScreen

## Using the Pop-up Keypads

The operator enters numeric and alpha-numeric values in the setup screens using the online keypads (Fig. 5 and Fig.6), which pop up when a recessed field, called a data cell, is touched. In most cases the data to be entered is numeric only and the numeric keypad will appear. In a few situations, (e.g., entering system names) alpha characters are needed and the same alpha-numeric keypad used to enter passwords is displayed. By default, data is displayed in English units but the TouchScreen can be configured to display metric units.

Touch **Cancel** to close the keypad without changing the data value.

Touch **Clear** to clear the character screen before entering data or to change an entry if incorrect data has been entered.

The operator must touch **Accept** to enter a value. The numeric values are recorded in the data cells that appear on each setup screen. If the value entered is out of range, a message containing the acceptable range is momentarily displayed in the keypad's readout window. For example, "Valid Range: 1.0–100.0". If this occurs, enter a valid value and touch **Accept**. This process must be repeated for each value entered.

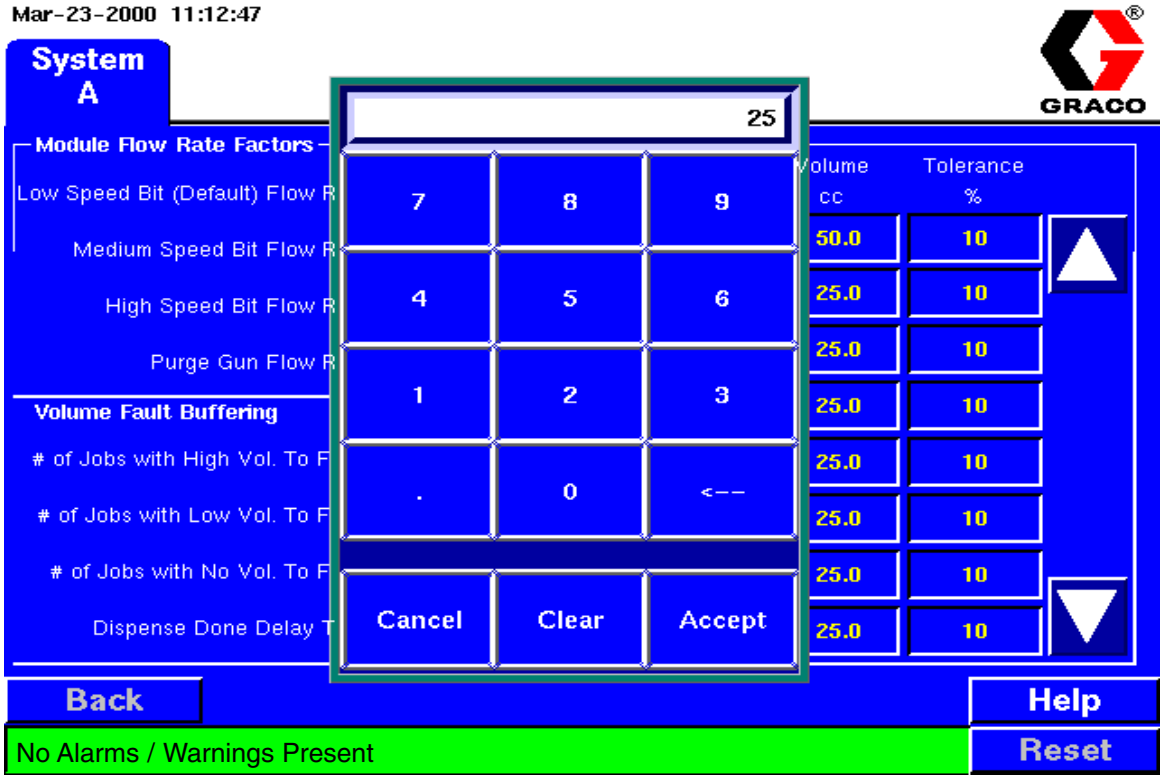


**Fig. 6**

# Overview Screen

The Overview screen displays a summary of current system information. This information is broken down into five areas that are accessed by touching the buttons at the bottom of the screen.

- **Module Status** (Fig. 7) has three columns of information and contains real-time indicators pertaining to volume, flow, and pressure. Volume reference values are shown on the left. General system status information, such as the selected style and gun outlet pressure are shown in the middle. Pressure sensor scaling data is shown on the right. All of these fields are shown in non-recessed data fields, indicating that on this screen, entry of data to these fields is not allowed. Note that some of these fields are displayed on other screens and may allow data entry there.
- **Module Settings** (Fig. 8) displays the operational modes of the PrecisionFlo Plus system. The operational mode cannot be changed from this screen. To change the operational mode, go to the password-protected Settings screen by touching **Settings** on the Navigation Bar.
- **Module I/O** (Fig. 9) and **Robot I/O** (Fig. 10) display the current status of the various hardwired I/O signals within the PrecisionFlo Plus control cabinet and between the control cabinet and the controlling robot, respectively. Each I/O point is marked with a point description, the terminal the signal is wired to, and a red/green light to indicate an energized/de-energized signal. Green indicates an energized signal.
- **Version Info** displays the revision level of the various software modules used in the PrecisionFlo Plus system, including the touch screen application and the PrecisionFlo Plus Module control code.

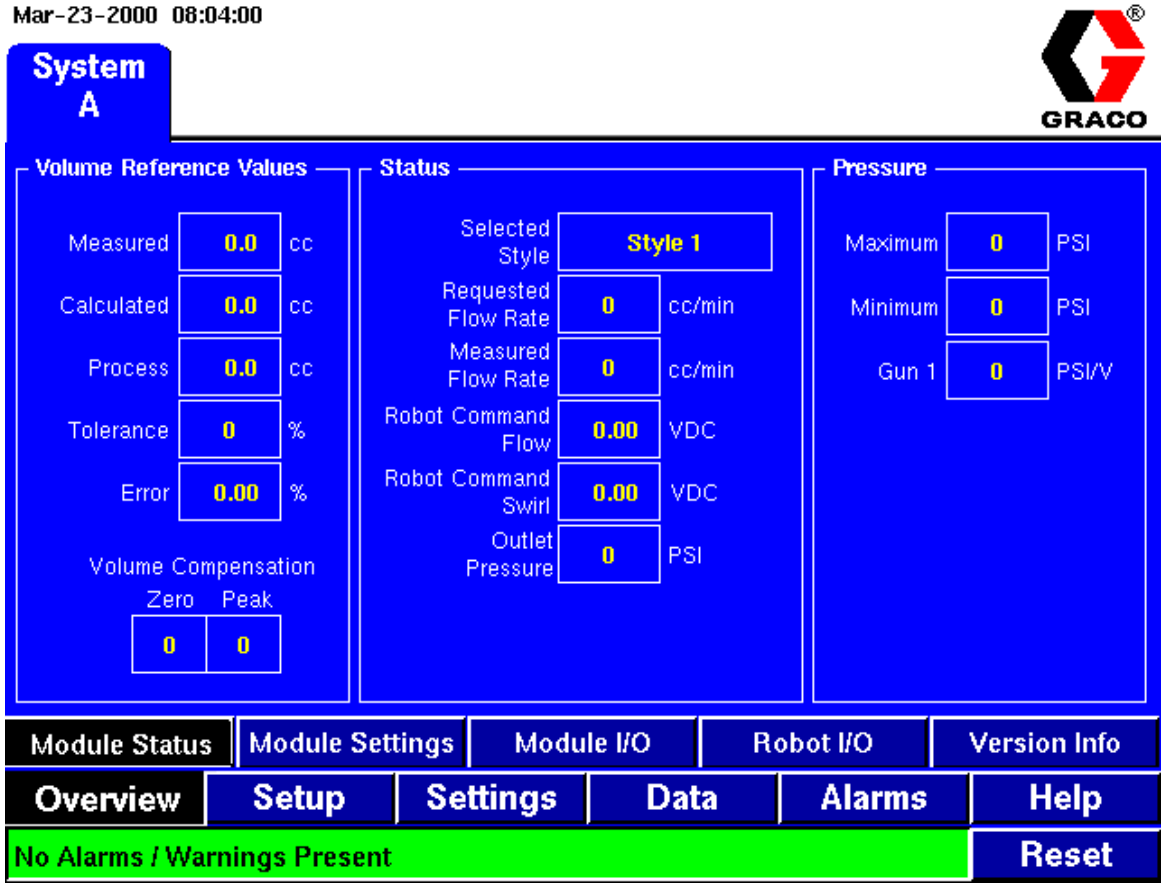


**Fig. 7**

# Overview Screen

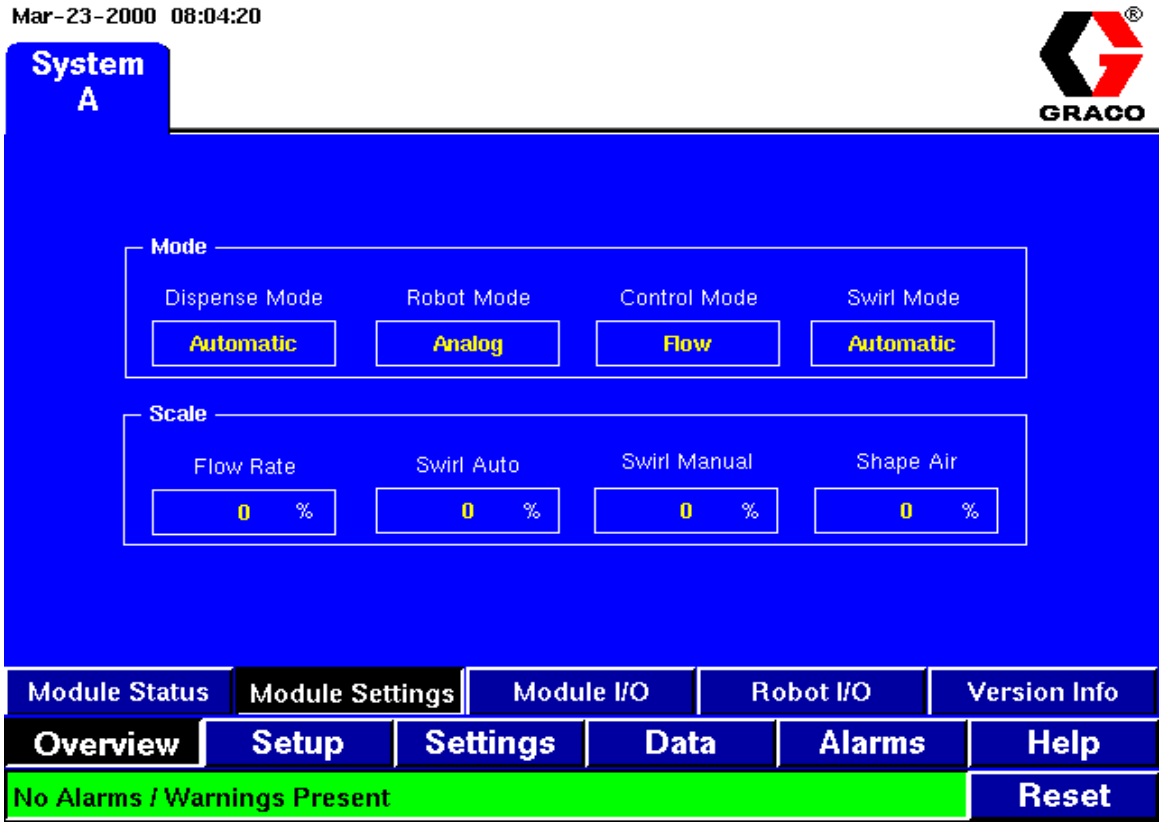


Fig. 8

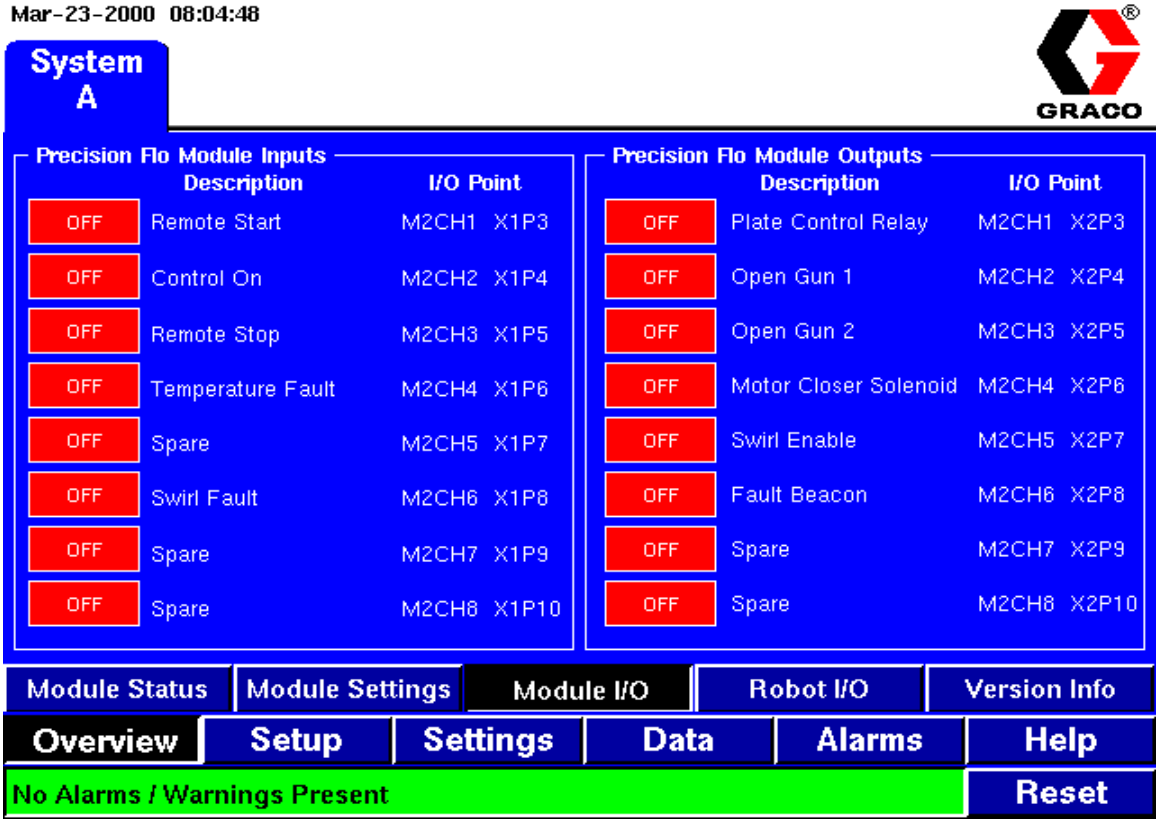


Fig. 9

# Overview Screen

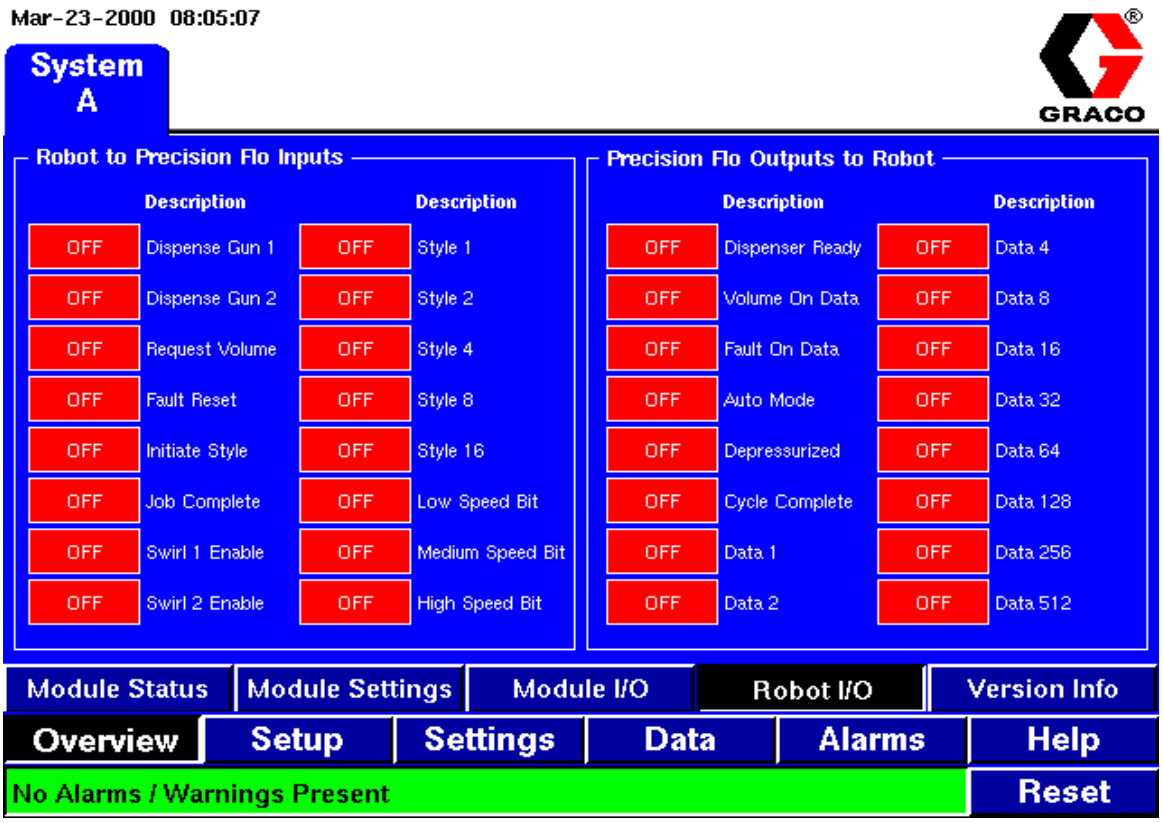


Fig. 10

# Setup Screen

The Setup screen (Fig. 11) displays:

- The General Setup column with buttons for Display Options and File Transfer.
- The Equipment Setup column with a button for the PrecisionFlo Plus Module.
- The TouchScreen control buttons.
- The Status Bar, which displays fault messages if any are present.
- The Reset button.

### General Setup

**NOTE:** The general setup screens are password-protected and accessible to authorized personnel only.

- **Display Options**. When this button is touched, the password screen appears. When the user password is entered and accepted the General Setup Area screen (Fig. 12) appears.
- **File Transfer.** Touch this button to transfer a file from a source diskette to the TouchScreen hard drive or from TouchScreen to a diskette. See Fig. 14.

### Equipment Setup

- **PrecisionFlo Plus**. When this button is touched and the user password entered, the PrecisionFlo Plus Setup screen (Fig. 15) appears. See page 15 for detailed information.

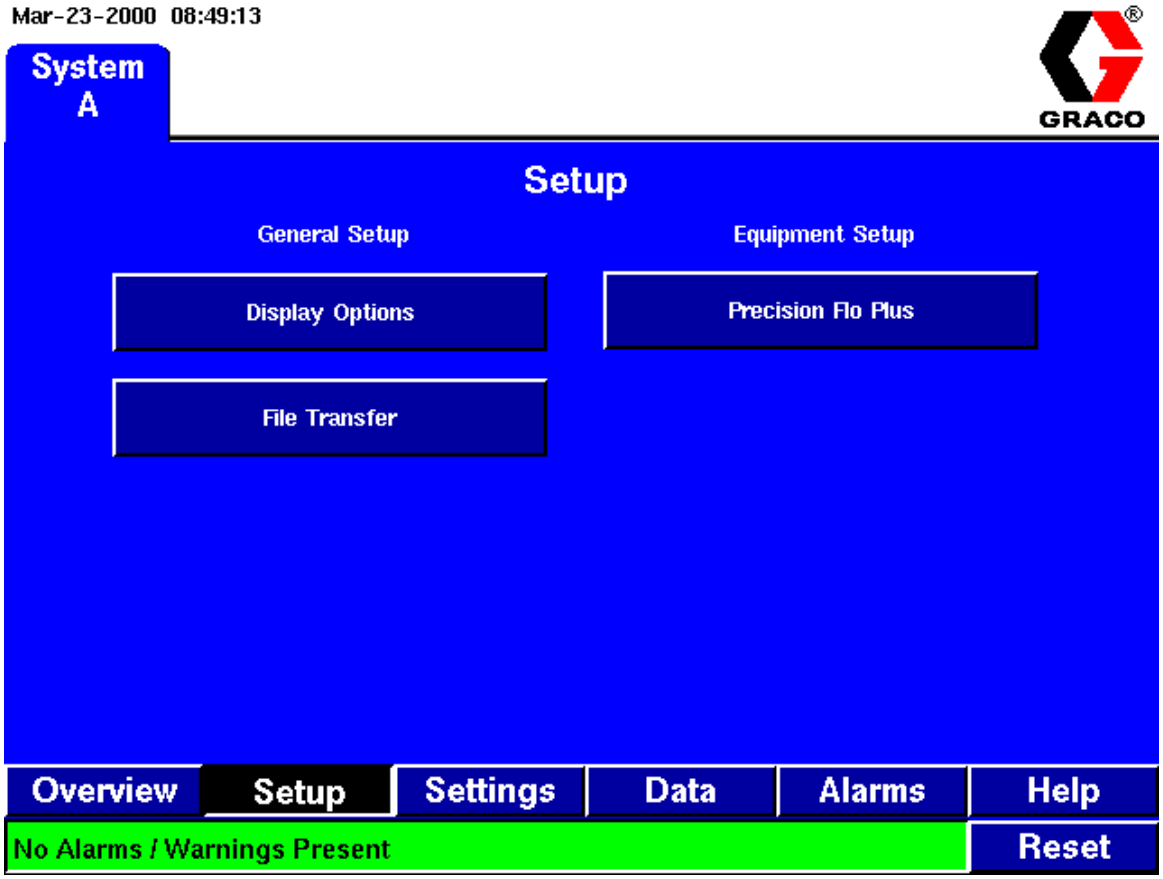


**Fig. 11**

# General Setup Area Screen

Touching **Display Options** under General Setup on the Setup screen and entering the user password brings up the General Setup Area screen shown in Fig. 12. The General Setup Area screen displays:

- A data cell used to assign the **System Name**. For example, System A.
- A data cell used to change the **Configuration Password**, which is used to access other setup screens. The default password is 555.
- Control buttons used to configure the system using either one or two dispense guns.
- The **Back**, **Help**, and **Reset** buttons.

To configure the Display Setup screen perform the following steps.

**NOTE:** Setup screens are password-protected.

1. Touch **Setup**. The Setup screen pops up
2. Touch **Display Options** . The keypad pops up.
3. Enter your password. Touch **Accept**. The General Setup Area screen appears.

The top left portion of the General Setup Area screen has three toggle buttons:

### Gun Configuration

The top two buttons are used to select the number of guns the system will use. The selection of two guns causes additional information and buttons to appear on various screens within the touch screen application.

### M3CH6 is Cycle Complete

The third button sets the configuration for the output signal M3CH6, an output from the PrecisionFlo Plus to the robot. The default for the button is the unselected state, where the output means “Cycle Complete.” If selected, the output means “In Cycle.”

### Delay Timer is Job Complete

The fourth button sets how the PrecisionFlo Plus determines when a job is complete.

If delay timer is chosen, the job is considered complete a configurable number of seconds after the gun stops dispensing. This time delay can be set on the Volume Parameters screen (Setup→PrecisionFlo Plus→Volume Parameters). The valid range is 1.0–30.0 seconds.

The other option for determining when the job is complete is chosen by touching the button to select M5CH6 (Robot I/O point M5CH6). With this option the job is considered complete when the M5CH6 I/O point from the robot is energized.

### Set PC Clock

Touching this button will display a screen that allows the user to set the PC’s time, date, and time zone (see Fig. 13).

### System Name

To set up the system name:

1. Touch the **System Name** data cell.
2. Enter the name and touch **Accept**. The system name also appears on the System tab at the top of the screen.

### Configuration Password

To set up the configuration password:

1. Touch the **Configuration Password** data cell. Wait for the keypad to pop up.
2. Enter the password and touch **Accept**.

### Language

The operator can select the desired language from the combo box. Available languages at the time of this printing are English (default), German, Spanish, French, and Italian. Changing the language takes effect immediately.

Japanese (kanji, katakana, and hiragana) is also available, but is not included in the standard software installation. If interested in Japanese or another language not listed, please contact your Graco sales representative.

### Pressure Units

Pressure units can be displayed in either PSI (pounds per square inch) or bar. PSI is the default.

# General Setup Area Screen

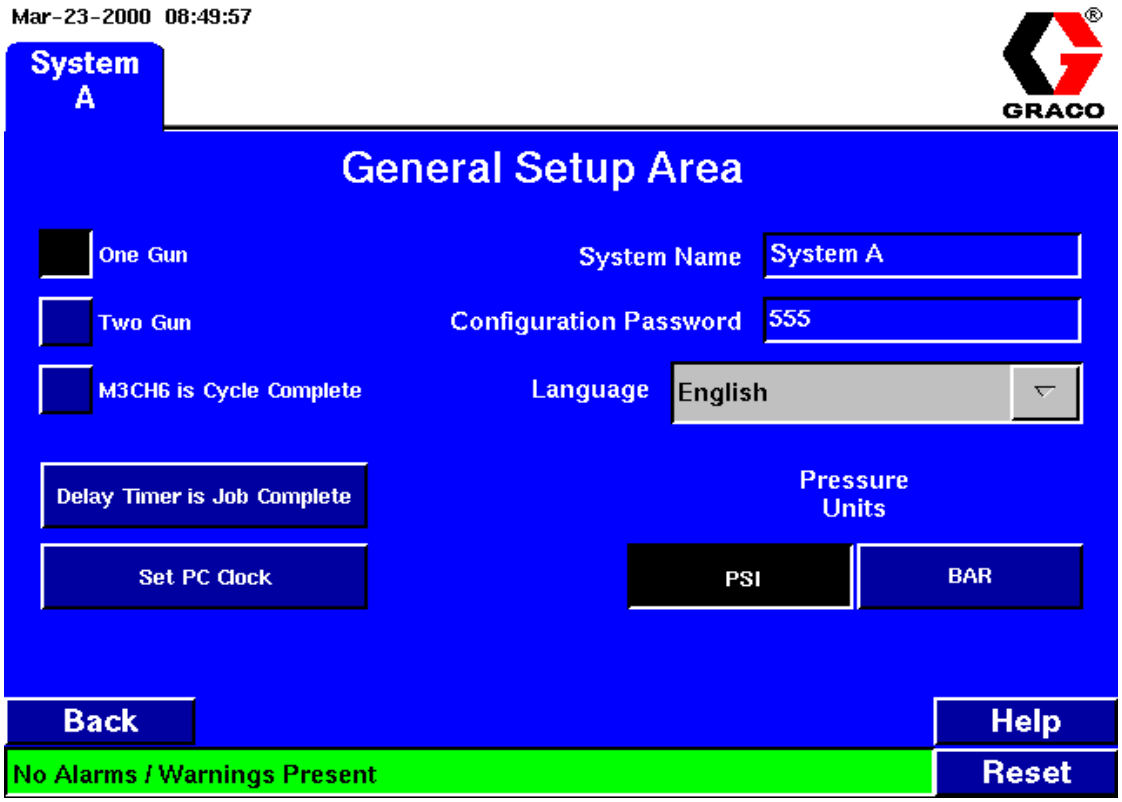


Fig. 12

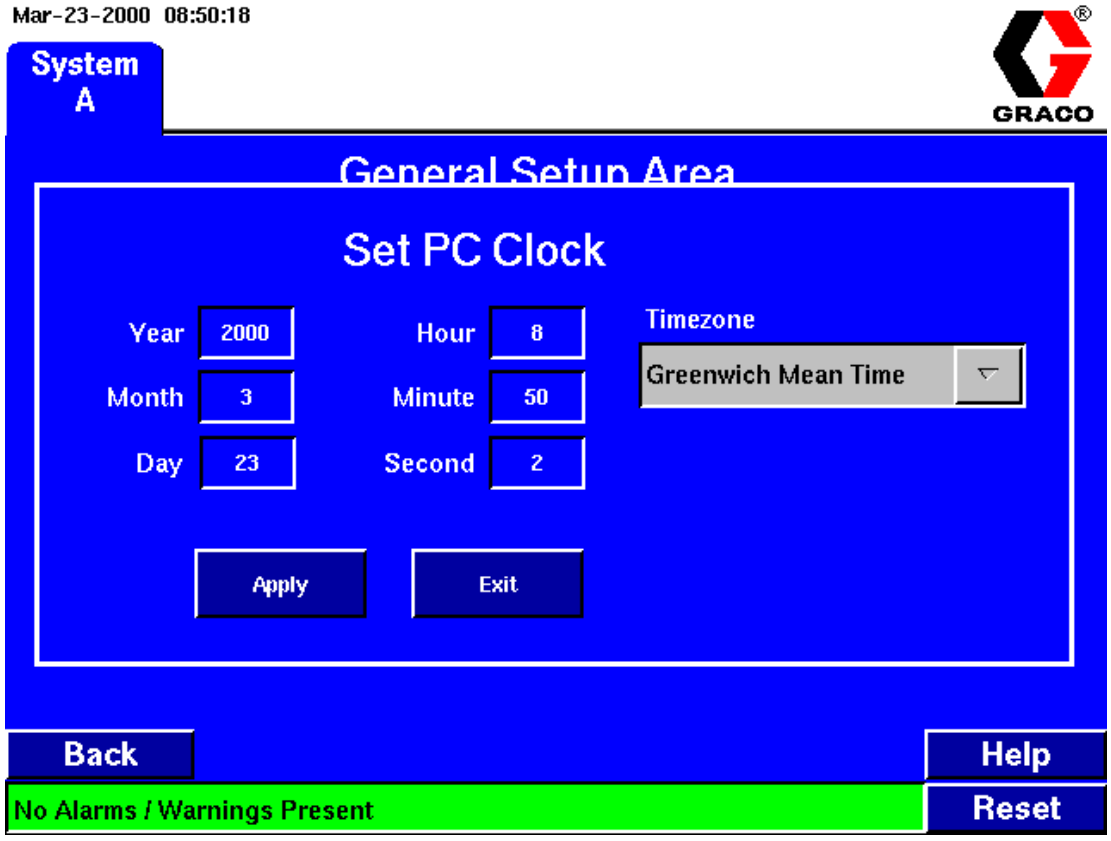


Fig. 13

# File Transfer Screen

Touching **File Transfer** under General Setup on the Setup screen brings up the File Transfer screen shown in Fig. 14. The File Transfer screen is provided to enable the operator to copy application-specific information from PrecisionFlo Plus to a DOS-formatted diskette. Disk drive unit 241236 contains the $3^1/2$ floppy drive and cable required.

Information is provided in text files. There are three types of files: alarm logs, data logs, and state files.

Alarm and data logs are described in detail on pages 25 and 26. State files are described on page 18 in the section on the Controller Files screen.

The File Transfer screen has four major areas. At the upper left, you can choose the type of file you wish to transfer. This acts as a filter so that only the file type you selected will be displayed in the transfer area of the screen. The majority of the screen is divided between the contents of the PrecisionFlo Plus and the contents of the floppy disk. Touch the **Re-read** button to refresh the contents of the file list. Two buttons in the middle of the file lists allow copying of files from the PrecisionFlo Plus to the diskette or vice versa. Files can also be deleted on this screen; be aware that, if you use this feature, there is no undelete or undo method. Status messages appear in the upper right.

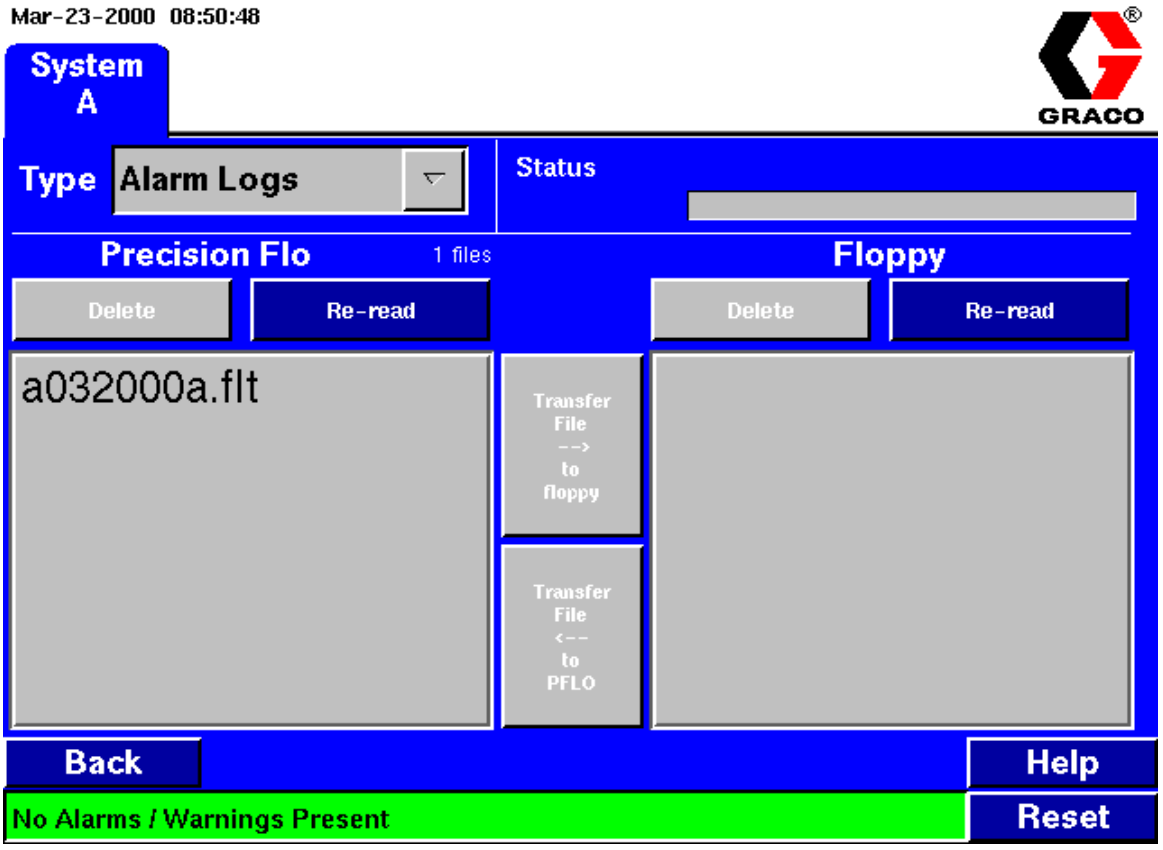


**Fig. 14**

# PrecisionFlo Plus Setup

Touching **PrecisionFlo Plus** under Equipment Setup on the Setup screen and entering the user password brings up the PrecisionFlo Plus setup screen shown in Fig. 15. The PrecisionFlo Plus Setup screen displays:

- Four control buttons that are used to access additional setup screens:
  - Flow Rate Calibration
  - Alarm/Warning Assignment
  - Volume Parameters
  - Pressure Parameters
- The **Back**, **Help**, and **Reset** buttons.

### Flow Rate Calibration

This screen (Fig. 19) is used to calibrate the PrecisionFlo Plus system. See page 20 for detailed information.

### Alarm/Warning Assignment

This screen (Fig. 20) is used to configure whether specific fault conditions will be treated as Alarms or as Warnings. See page 21 for detailed information.

### Volume Parameters

This screen (Fig. 21) is used to configure PrecisionFlo Plus volume parameters. See page 22 for detailed information.

### Pressure Parameters

This screen (Fig. 22) is used to configure PrecisionFlo Plus pressure parameters. See page 24 for detailed information.

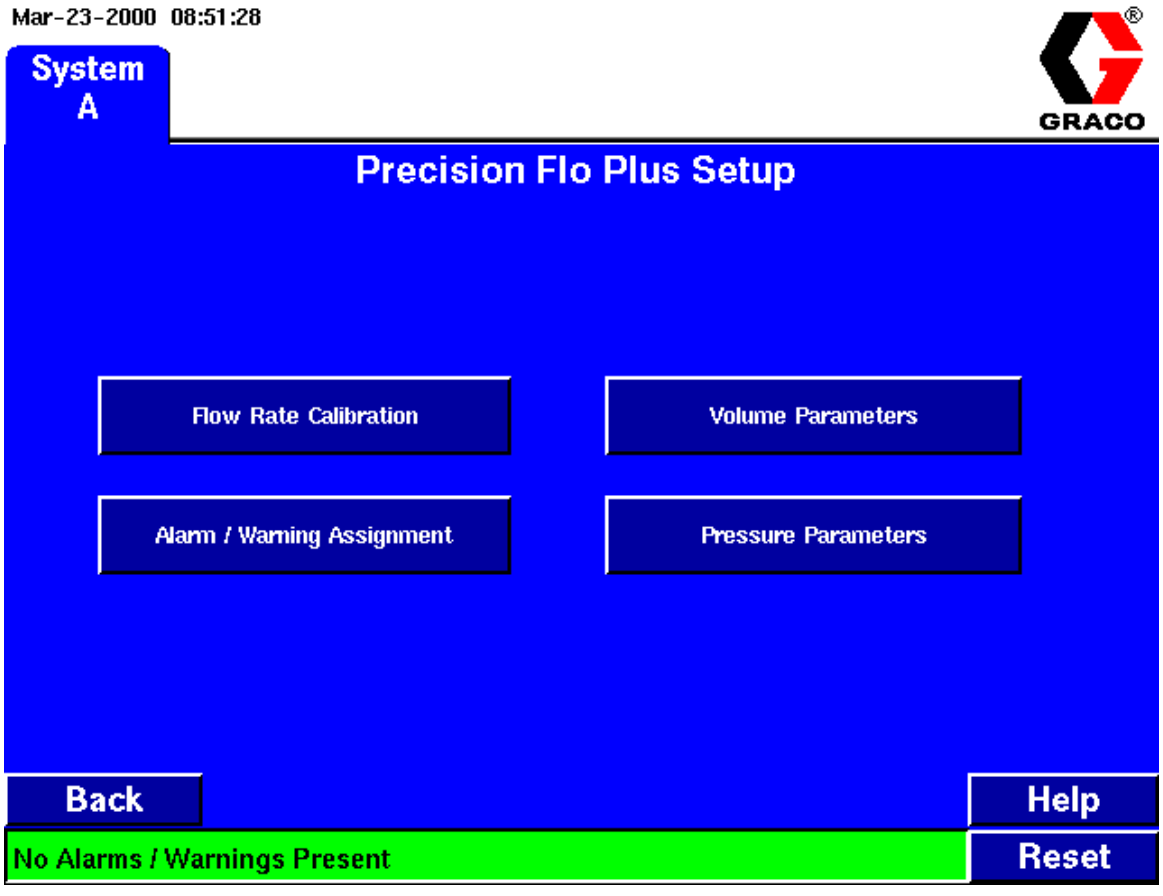


**Fig. 15**

# PrecisionFlo Plus Setup

## Setup Using Supervisor Access

If the super user password is used to access the resulting PrecisionFlo Plus Setup screen includes two additional control buttons as shown in Fig. 16. They are:

- Dispense Parameters
- Tune Fluid Module

### Dispense Parameters

From the Dispense Parameters screen (Fig. 17), an authorized operator can adjust the following variables:

- Kp and Kd – gains used by the PrecisionFlo Plus Module in its pressure control loop.
- Flow Meter K Factor – the number of flow meter pulses for each liter of material passing through the meter.
- Flow Mode Correction Factor – used in Volume Compensation calculations. The normal setting is zero.
- Flow Average – the number of flow meter pulses used for flow rate calculations.
- Gun On/Off and Regulator On/Off Delays – used to adjust for delays in the pneumatic dispense valves.

**NOTE:** For detailed information on making these adjustments, see Manual 310558, PrecisionFlo Plus Control Assembly.

Touching **Save/Load Settings** on this screen brings up the Controller Files screen shown in Fig. 18, where factory default settings can be loaded or current system settings saved.

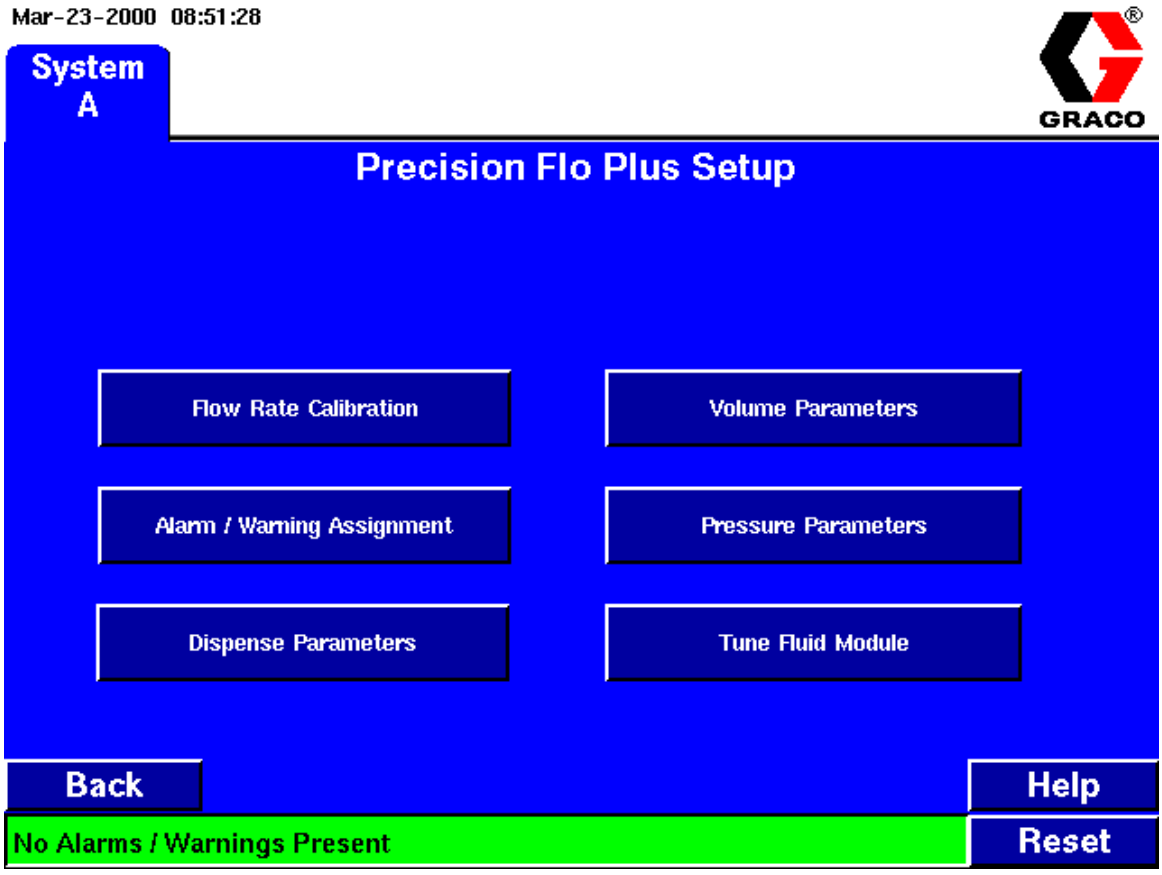


**Fig. 16**

# PrecisionFlo Plus Setup

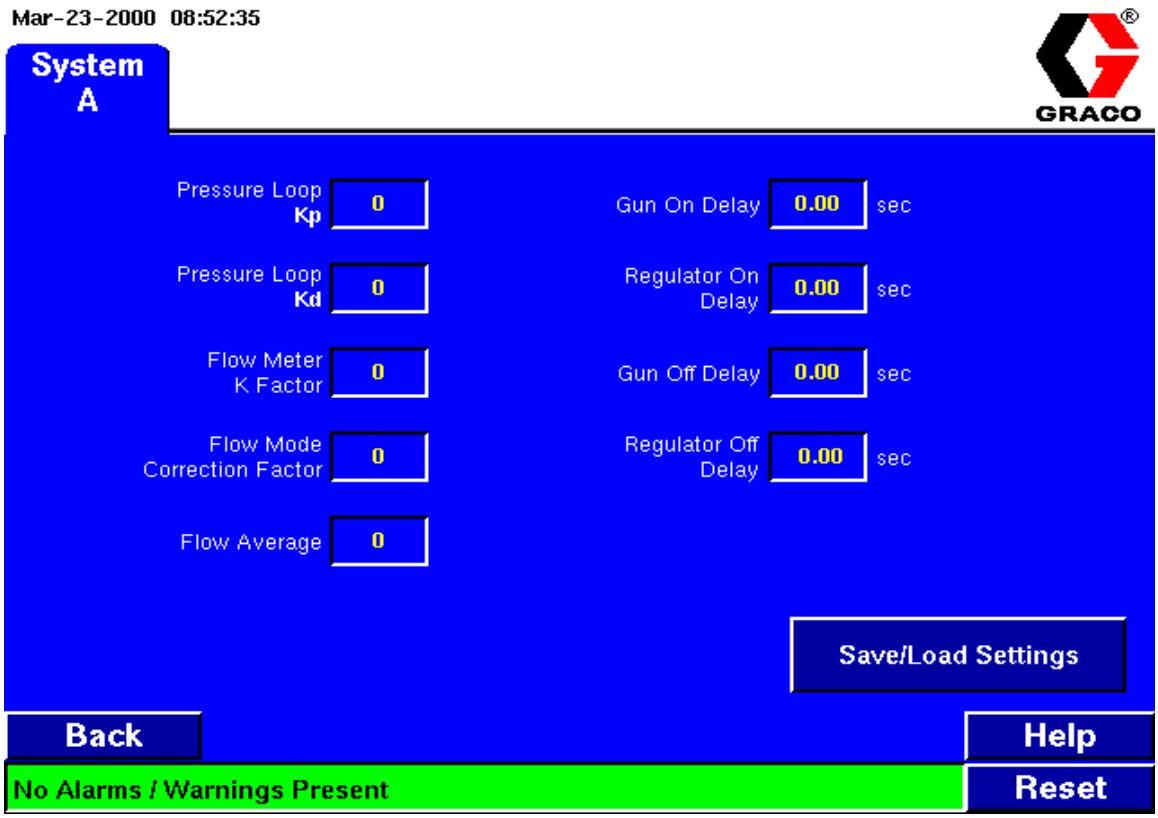


Fig. 17

# PrecisionFlo Plus Setup

## Controller Files Screen

The Controller Files screen is generally used for two purposes:

1. To save a copy of the current system parameters for safekeeping. This allows the operator to quickly set all of the parameters across the board in one operation, possibly to restore the system to a known stable state.

2. To load default factory parameter settings.

To save the current system settings to a new file, touch the **Save As** button. You will be prompted for a file name. The saved file name will appear in the Available Controller Files window on the left.

**NOTE:** The file name must be eight characters or less and may consist of any combination of upper- and lower-case letters and numbers, no spaces, punctuation or other characters. Use a naming scheme that makes it easy to determine the content of the file based on the file name.

To save the current system settings to an existing file, select a file from the Available Control Files window and touch the **Save** button. This will overwrite the file's contents with the current system settings.

See Fig. 18 for an example of a saved settings file. The letter 'A' in parentheses before the file name indicates that the saved settings file corresponds to System A. By convention, the letters A, B, C, and D distinguish between PrecisionFlo Plus Modules and are useful in multiple-system applications. In a standalone system, A is the default system marker.

**NOTE:** If the system name is changed from the default "System A" in the General Setup Area (see page 12), the letter 'A' marking convention is still used on this screen.

The following example, using a multiple-system application, demonstrates how this marking system saves configuration and setup time. Assume that two PrecisionFlo Plus Modules (System A and System B) are connected to one TouchScreen operator interface. Set all parameters for optimum performance of System A and save those settings on this screen. Then, touch the System B tab to switch to System B. Load the system settings file you just saved for System A by touching the Load button while the System A file name is highlighted. Note that, although you are loading the settings into System B's Module (because you've selected the System B tab), you have the ability to load a known-good, application-specific, settings file that was initially configured for another system. You can then make changes this new file to configure optimum performance for System B.

To permanently delete a system settings file, select the file name from the window and press Delete. There is no way to recover a deleted file, so use this feature with caution.

To load a system settings file, select the file name from the window and press Load. This will restore ALL the system parameters to the state represented by the contents of the system file. There is no "undo" feature, so if you are unsure about what it is the selected system file contains, save the current settings to a temporary file before doing this. This will allow you to revert back to the initial state in the event the new settings are not what you want.

To restore the system parameters back to the factory defaults, press Load Factory Defaults. Note that these values will almost certainly need adjustment for your specific application, but are a good starting point for configuring your system.

In order to retain specific system parameters in the case of a controller battery failure, the system parameters must be written (or "saved") to the PrecisionFlo Plus Module's flash EPROM. This is accomplished by touching Write Flash EPROM. If the Module loses power for ANY reason, the system parameters are retained indefinitely in EPROM and are used on successive power-ups.

**NOTE:** To retain application specific system parameters as defaults, you must write them to flash by pressing the Write Flash EPROM. If this is not done, the system will use default factory settings if the battery in the PrecisionFlo Plus controller fails.

**NOTE:** The Last Status indicator located at the top of the screen is used to convey status to the operator on the progress or result of any actions taken. For example, if you enter an invalid file name, the text "Invalid file name" will appear.

# PrecisionFlo Plus Setup

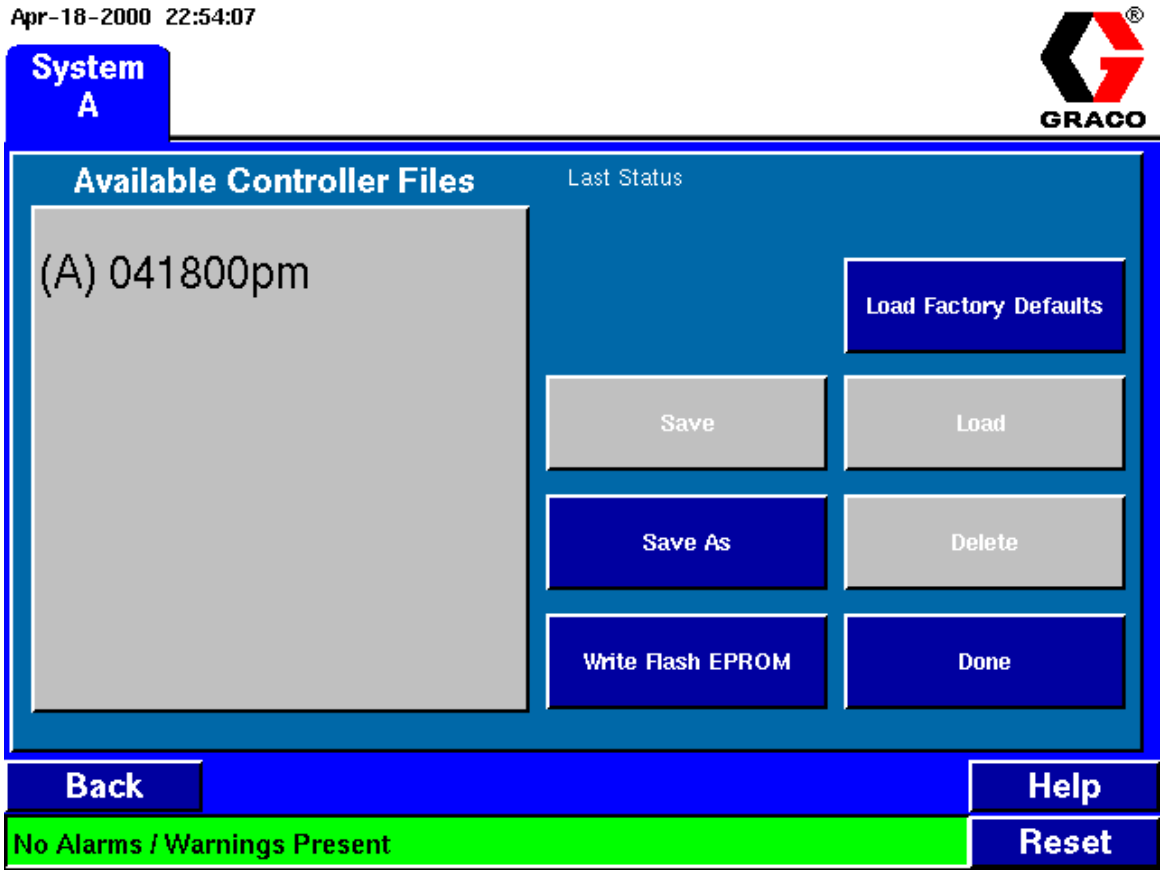


Fig. 18

# PrecisionFlo Plus Setup

## Flow Rate Calibration Screen

The Flow Rate Calibration screen (Fig. 19) displays:

- The settings for outlet pressure, actual flow rate, and target flow rate.
- Control features that compile statistical process control data in the form of flow tables. These tables are internal to the controller and not viewable.
- Reference indicators that display the pressure reading of the last successful calibration.
- A flow table status indicator
- Settings used by the calibration process
- The **Back**, **Help**, and **Reset** buttons.

**NOTE:** The system Dispense Mode must be Manual for the calibration sequence to start.

The calibration sequence dispenses fluid at various pressure levels and measures the corresponding flow rates. This sequence takes about 30 seconds to complete. During the calibration sequence, the controller builds an internal flow table of pressure vs. flow. Based on this calibration, the controller is able to follow a real–time flow rate command signal from the robot during a job.

To configure Flow Rate Calibration:

**NOTE:** Target Flow Rate is a read/write data cell, the value can be changed.

1. Enter the operating flow rate for Gun 1 as follows:
   a. Touch the **Target Flow Rate** data cell. The keypad pops up.
   b. Enter the value and then touch **Accept**.

   or enter the desired bead size (mm diam.) and maximum robot speed (mm/s). The system will then calculate the target flow rate
2. Touch one of the data cells listed below, wait for the keypad to pop up, enter the value, and touch **Accept**. Repeat the process for each data cell.
   – **Calibration Tolerance %**
   – **Max Calibration Time (sec)**
   – **Min Stability Time (sec)**
3. Touch **Calibrate Gun 1** and wait approximately 30 seconds to complete the calibration process.
   a. If the “GUN1: Calibrated” message appears, the calibration process is complete.
   b. If the “GUN1: Not Calibrated” message appears, repeat steps 1, 2, and 3 until the “GUN1: Calibrated” message appears.
4. Touch **Back** to return to the PrecisionFlo Plus Setup screen.

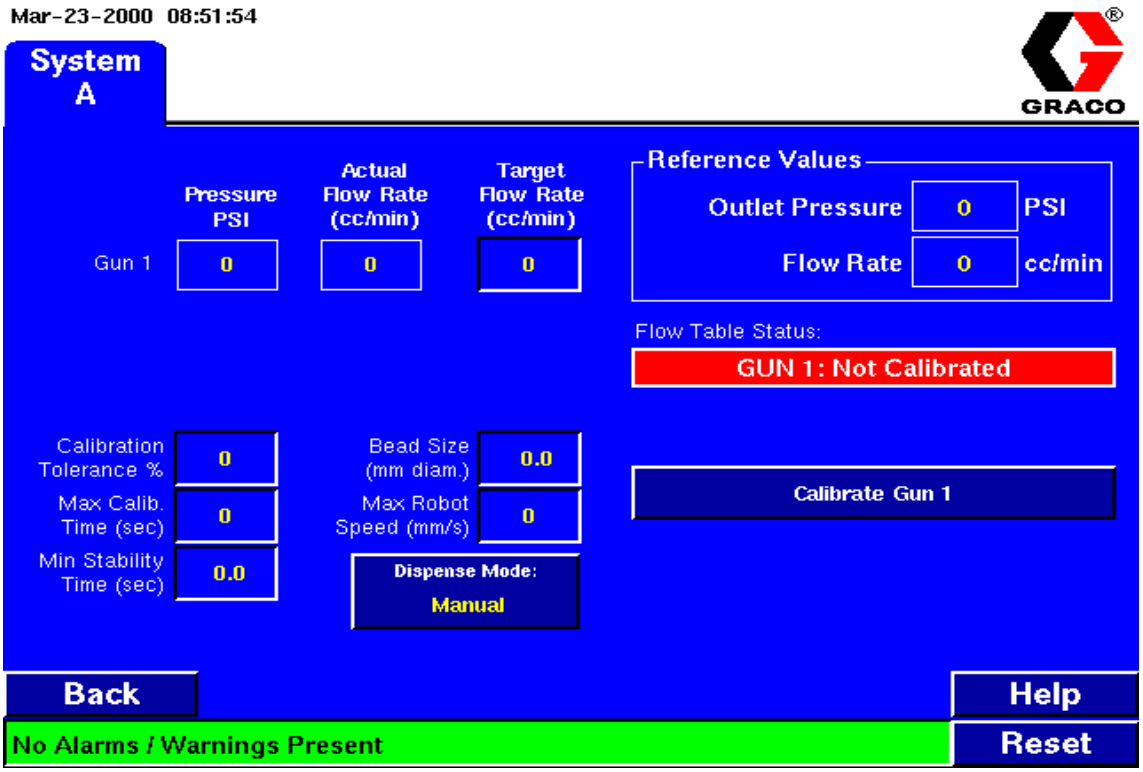


**Fig. 19**

# PrecisionFlo Plus Setup

## Alarm/Warning Assignment Screen

The Alarm/Warning Assignment screen (Fig. 20) displays:

- Twelve control buttons that can be individually configured as either Warnings or Alarms:
  - Inlet Pressure Low (not currently enabled)
  - Inlet Pressure High (not currently enabled)
  - Outlet Pressure Low
  - Outlet Pressure High
  - Swirl Speed Error
  - Temperature Conditioner Fault
  - Flow Calibrations Failure
  - Motor Over Temperature (not currently enabled)
  - High Volume on Last Job
  - Low Volume on Last Job
  - No Flow on Last Job
  - Process Target Error
- The **Back**, **Help**, and **Reset** buttons.

**NOTE:** Setup screens are password-protected.

Of the 12 system faults shown on the Alarm/Warning Assignment screen, three of them (Inlet Pressure Low, Inlet Pressure High, and Motor Over Temperature) are not activated at the time of this writing. The disabled condition is indicated by grayed text and touching these buttons will have no effect.

Each of the eight active buttons corresponds to a specific system fault that can be configured as either an alarm or a warning. Touching the button will toggle between the two states. Configured as an alarm, the event will inform the robot controller to stop dispensing; as a warning, it will not. In either case, the event is logged to the alarm log (Alarms).

To configure the Alarm/Warning Assignment screen:

1. Touch **Setup**. The keypad pops up
2. Enter the password and then touch **Accept**. The Setup screen appears.
3. Touch **Precision Flo Plus**. The PrecisionFlo Plus Setup screen appears.
4. Touch **Alarm/Warning Assignment**. The Alarm/Warning Assignment screen (Fig. 20) appears.
5. Determine the appropriate assignment for each fault condition and touch the button to toggle between **Alarm** and **Warning**.

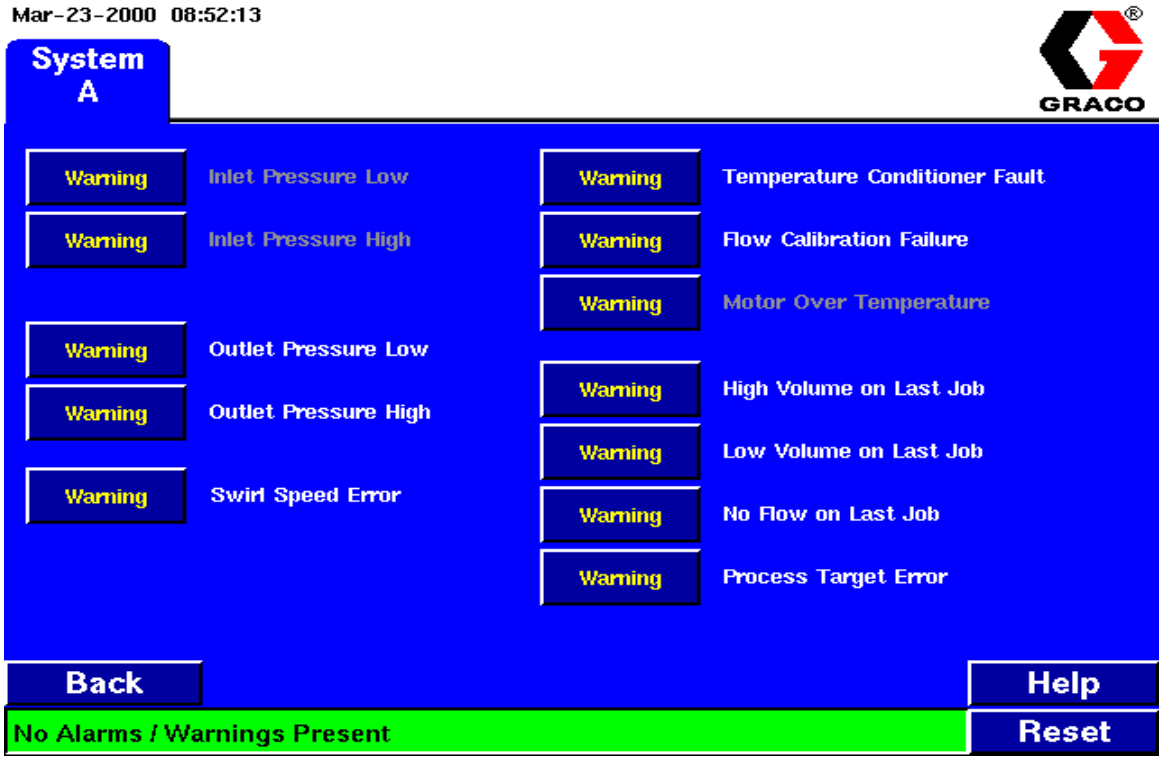


Fig. 20

# PrecisionFlo Plus Setup

## Volume Parameters Screen

The Volume Parameters screen (Fig. 21) displays:

- **Module Flow Rate Factors**
- **Volume Fault Buffering** Configuration
- **Style Volume Setup** keeps track of the target volume of material and the allowable tolerance percent for up to 32 different styles. The style bits are used for SPC data collection. Touch the up and down arrows to view the full range of styles.
- The **Back**, **Help**, and **Reset** buttons.

**NOTE:** Setup screens are password-protected.

To configure the Volume Parameters screen:

1. Touch **Setup**. The keypad pops up
2. Enter your password and then touch **Accept**. The Setup screen appears.
3. Touch **Precision Flo Plus**. The PrecisionFlo Plus Setup screen appears.
4. Touch **Volume setup** . The Volume Setup screen appears. See Fig. 21.

### Module Flow Rate Features

To configure Module Flow Rate Features:

1. Touch the **Low Speed Bit (Default) Flow Rate** data cell. Wait for the keypad to pop up. Enter the percent value. Touch **Accept**.
2. Repeat step 1. to set the **Medium Speed Bit Flow Rate** and the **High Speed Bit Flow Rate**.

The PrecisionFlo Plus Module can dispense material based on a continuously changing analog voltage command signal from a controlling robot or it can dispense at any of three predetermined, discrete flow rates. These three flow rates are set on this screen and are called low, medium, and high speed bit flow rates. Default values are set to 25, 50, and 75 percent of full speed (equivalent to 2.5, 5.0, and 7.5 Vdc robot commands), respectively.

Purge Gun Flow Rate is the flow rate used for manual dispensing. The range of 0- to 100% set a 0 to 10 Vdc command, which is used with the psi/volt setting to determine the purge pressure target (see (Fig. 22), pressure parameters screen).

### Volume Fault Buffering

The following fields can be configured on this screen:

- # of Jobs with High Vol. to Fault
- # of Jobs with Low Vol. to Fault
- # of Jobs with No Vol. to Fault
- Dispense Done Delay Time

To configure Volume Fault Buffering:

1. Touch the applicable data cell. When the keypad comes up, enter the value. Touch **Accept**.
2. Repeat step 1. to set the remaining digital speed bits.

The parameters listed here affect how the PrecisionFlo Plus Module responds to irregular system events, such as a higher than expected volume of material dispensed. The fault condition generated is treated as an alarm and, as such, would cause the system to shut down. In addition to setting the acceptable number of sequential jobs with high volume before a fault is generated, the number of low volume and no volume jobs can also be set. The default settings for these three parameters are one job.

Dispense Done Delay Time is a timer that is used to determine when a job is considered complete. If this timer is used (determined by the configuration settings on the General Setup Area screen, Setup→Display Options), the PrecisionFlo Plus Module considers the current job complete after the “gun on” dispense command from the robot is deactivated for this many seconds. The default is 5.0 seconds.

# PrecisionFlo Plus Setup

### Style Volume Setup

1. To enter the target volume, percent tolerance, and application-specific style name for each style:

   a. For the first style, touch the **Style Name** data cell. When the keypad comes up, enter a descriptive style name. Use the shift key to toggle from upper- to lower-case letters.

   b. Touch the **Volume cc** data cell. When the keypad comes up, enter the value. Touch **Accept**.

   c. Touch the **Tolerance %** data cell. When the keypad comes up, enter the value. Touch **Accept**.

   d. Repeat steps 1. a. through 1. c. to enter values for styles 2 through 32, as necessary.

2. Touch **Back** to return to the PrecisionFlo Plus Setup screen.

By default, the 32 available styles are named Style N, where N is a number between 1 and 32. These names can be changed to something more specific to your application. The name of the style currently in use is displayed on the Overview screen. In addition, the style name is part of the job record that is logged in the data log upon completion of each job. The style name can include any of the characters on the alphanumeric keypad; due to readable screen space constraints on this screen and the Data screen, the name should be kept to eight characters or less in length.

In this same area, the target volume and tolerance can be set for each style.

Eight styles are shown at a time; press the up or down arrow to access additional styles.

Mar-23-2000 08:53:32
System A
GRACO
Module Flow Rate Factors
Low Speed Bit (Default) Flow Rate 0 %
Medium Speed Bit Flow Rate 0 %
High Speed Bit Flow Rate 0 %
Purge Gun Flow Rate 0 %
Volume Fault Buffering
# of Jobs with High Vol. To Fault 0
# of Jobs with Low Vol. To Fault 0
# of Jobs with No Vol. To Fault 0
Dispense Done Delay Time 0.00 Sec
Style Volume Setup
Style
Volume cc
Tolerance %
0 Style 1 0.0 0
1 Style 2 0.0 0
2 Style 3 0.0 0
3 Style 4 0.0 0
4 Style 5 0.0 0
5 Style 6 0.0 0
6 Style 7 0.0 0
7 Style 8 0.0 0
Back
Help
No Alarms / Warnings Present
Reset

Fig. 21

# PrecisionFlo Plus Setup

## Pressure Parameters Screen

The Pressure Parameters screen (Fig. 22) displays:

- The following pressure limits for the applicable dispense device. For example, Gun 1.
  - Outlet Pressure, Low Limit
  - Outlet Pressure, High Limit
  - Pressure Mode PSI / Volt
- The **Back**, **Help**, and **Reset** buttons.

**NOTE:** Setup screens are password-protected.

**NOTE:** For systems configured with two guns, this screen appears with additional data cells for **Gun 2** and **Guns 1 & 2**.

To configure the Pressure Parameters screen:

1. Touch **Setup**. The Setup screen appears.
2. Touch **Precision Flo Plus**. The keypad pops up.
3. Enter your password and then touch **Accept**. The PrecisionFlo Plus Setup screen appears.
4. Touch **Pressure Parameters**. The Pressure Parameters screen (Fig. 22) appears.
5. Touch the **Outlet Pressure Low Limi**t data cell, . When the keypad comes up, enter the value and then touch **Accept**.
6. Touch the **Outlet Pressure, High Limit** data cell. When the keypad comes up, enter the value and then touch **Accept**.
7. Touch the **Pressure Mode PSI / Volt** data cell. When the keypad comes up, enter the value and then touch **Accept**.
8. Touch **Back** to return to the PrecisionFlo Plus Setup screen.
9. Touch **Back** again and then touch **Overview** to return to the Overview screen.

# PrecisionFlo Plus Setup

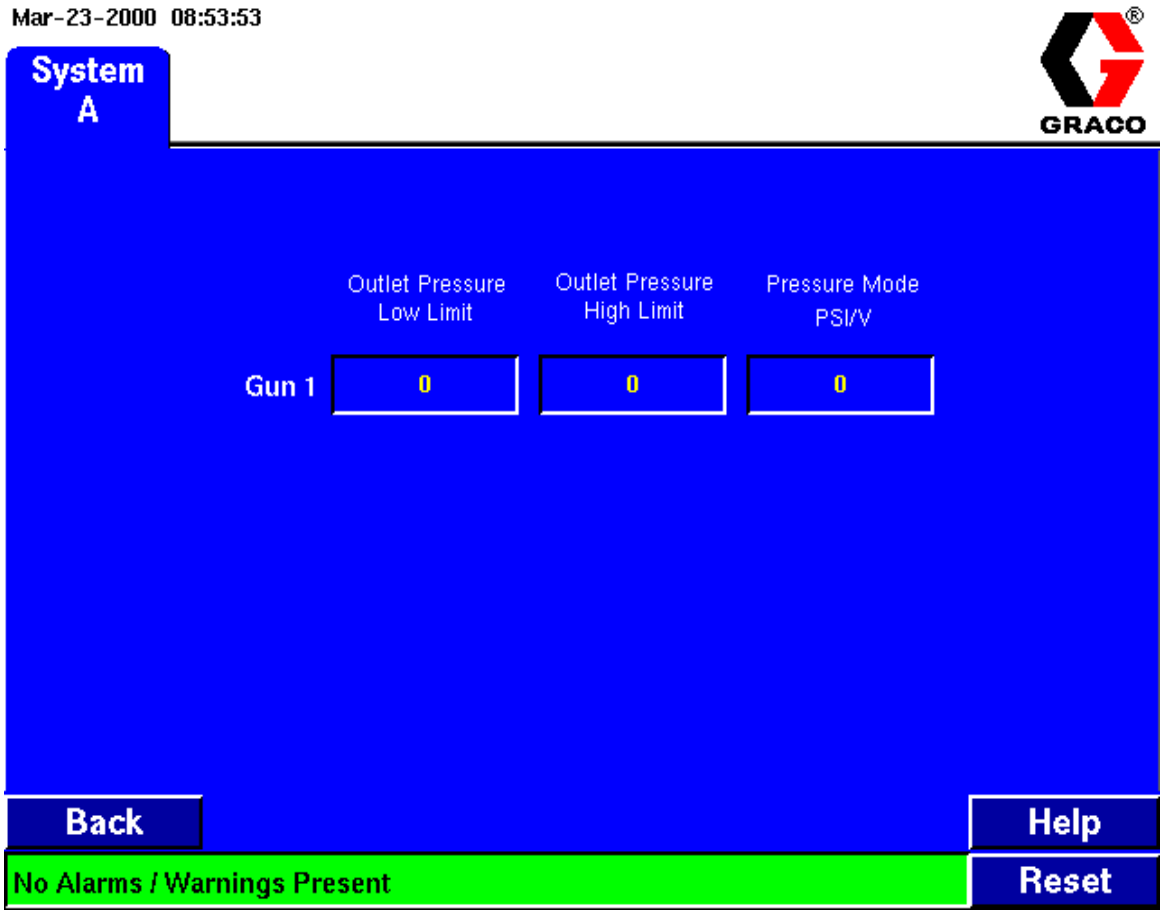


Fig. 22

# PrecisionFlo Plus Setup

## Tune Fluid Module Screen

The Tune Fluid Module screen ( Fig. 23) consists of a trend window and supporting controls. From this screen, the operator can change operational modes, trend select variables, modify system parameters, and manually dispense material.

The trend window takes up the bulk of the screen. To the left of the trend window are a set of ± buttons to incrementally modify the upper range of the trend window. The upper limit can also be set directly by touching the recessed data cell directly and entering a value from the pop–up keypad. The lower limit is set in a similar fashion. The default lower and upper limits are 0 and 1000. The lower limit must be a value less than the upper limit.

Directly below the trend window are two slider bars, labeled Sample Rate and Expand. The Sample Rate slider bar is used to adjust the rate at which the TouchScreen retrieves values from the PrecisionFlo Plus Module. The Expand slider bar is used to adjust the number of waveform cycles displayed in the trend window at any one time. Under most conditions, the default positions of both slider bars allow for satisfactory trend waveforms and do not need modification.

To the right of the trend window is a column of five buttons, each of which corresponds to a single system variable controlled or monitored by the PrecisionFlo Plus Module. Each button lists the variable name, current value, and the units the variable is measured in. In addition, below this information on the button there is a colored legend bar used to identify the variable's waveform in the trend window.

The buttons are as follows:

- Measured Flow Rate – this is the actual flow rate measured by the system flow meter, in units of cubic centimeters per minute (cc/min).
- Expected Flow Rate – the flow rate setpoint, also in cc/min.
- Robot Command – a 0-10 Vdc signal from the controlling robot, indicating desired flow rate command.
- Measured Pressure – the actual outlet pressure, measured at the PrecisionFlo metering valve outlet. This can be in units of PSI or bar, depending on system configuration.
- Expected Pressure – the outlet pressure setpoint, also in PSI or bar.

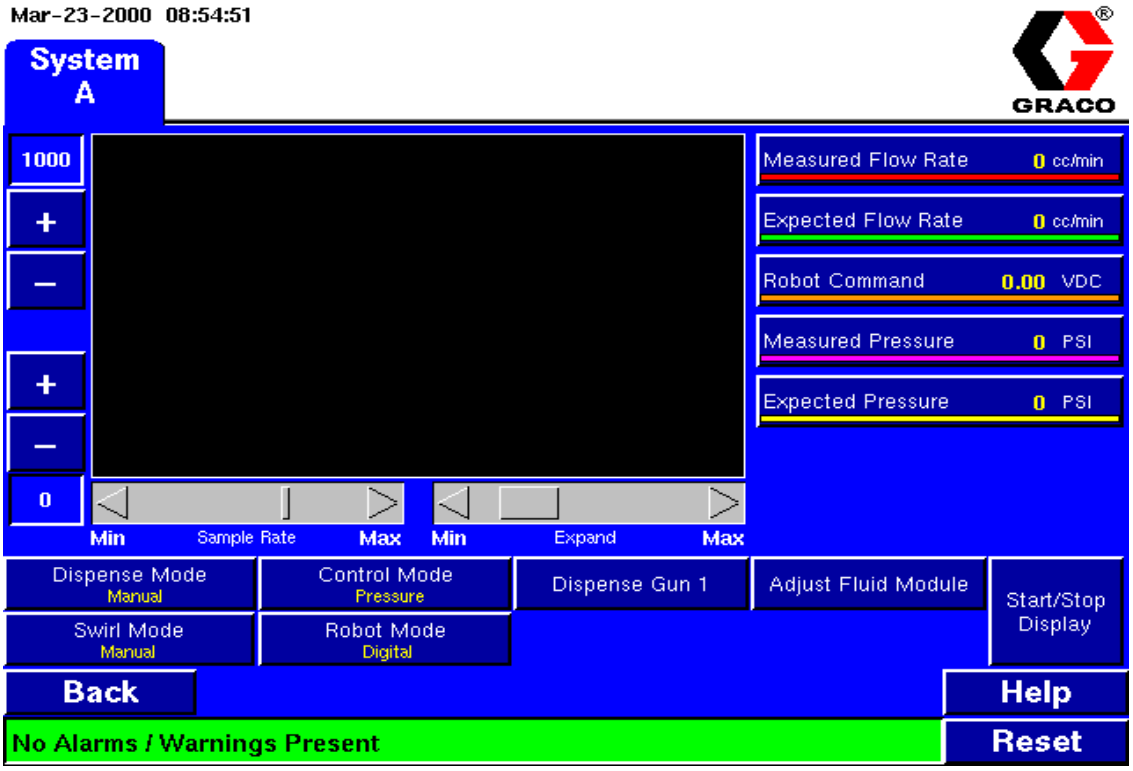


**Fig. 23**

# PrecisionFlo Plus Setup

To begin trending, touch the **Start/Stop** Display button. The button stays indented, indicating that it has been selected. Next, choose the variable(s) you want to trend by pressing the appropriate button(s) to the right of the trend window. When selected, these variable buttons also remain indented and the label color changes to match the waveform color for that variable. Any combination of the five variables can be trended at any time.

**NOTE:** The waveform for the robot command is scaled by a factor of 100 in the trend window. For example, if the robot command is 4.5 Vdc, this point on the plotted waveform will be a value of 450. This means that the 0-10 Vdc signal will actually be plotted on a 0-1000 scale.

To stop trending a variable, touch the appropriate variable button; it will pop out, indicating it is no longer selected.

If Start/Stop Display is touched during a trend event, a snapshot of the current waveform(s) will be captured in the trend window. The snapshot will be retained until the Start/Stop Display button is pressed again or until power to the PrecisionFlo Plus is cycled. There is no mechanism for saving this snapshot to disk for permanent storage.

**NOTE:** When the Start/Stop Display button is not selected, no trending is done, even if variables have been selected.

Most of the buttons listed along the bottom of the screen represent functionality that can all be found in other places in the TouchScreen application, but are included on the Tune screen for convenience. This functionality includes the ability to toggle Dispense, Control, Swirl, and Robot modes and manually dispense material.

The Adjust Fluid Module button activates a pop–up window (Fig. 24) that allows the operator to change additional system parameters, otherwise located on the Dispense Parameters screen (Setup→PrecisionFlo Plus→Dispense Parameters).

**NOTE:** If the Adjust Fluid Module button is pressed during a trend event, the Start/Stop Display button is automatically deselected until the Adjust Fluid Module Parameters pop–up window is closed. This means that while this pop–up window is open, trending does not take place.

Regardless of operational modes or system settings, the Tune screen can be used to trend any combination of the five system parameters shown to the right of the trend window.

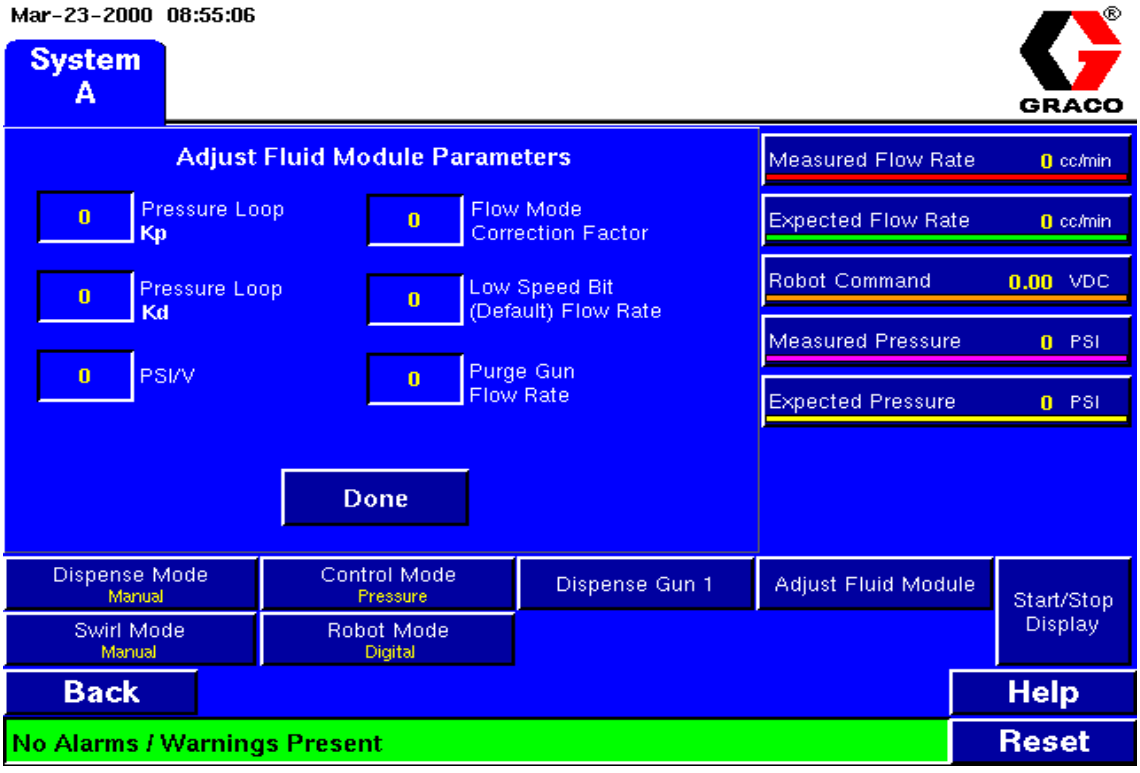


**Fig. 24**

# PrecisionFlo Plus Settings Screen

The PrecisionFlo Plus Settings screen (Fig. 25) displays:

- The operator settings for the current dispense session, which is controlled by the robotic interface or the PrecisionFlo Plus module.
- The TouchScreen control buttons.
- The Status Bar, which turns the fault message on and off.
- The Fault **Reset** button.

**NOTE:** The Settings screen is password-protected.

- **Operational Modes**. These parameters, located on the top left section of the screen, allow the operator to view current modes and to change them by touching the appropriate toggle button. The four buttons allow the operator to choose between the values listed on the following chart:

| Parameter | Choices | |
|---|---|---|
| Dispense Mode | Auto | Manual |
| Control Mode | Pressure | Flow |
| Robot Mode | Analog | Digital |
| Swirl Mode | Auto | Manual |

- **Global Adjustments**. The four sets of arrow buttons located on the top right section of the screen are used to adjust the material flow rate, swirl auto and swirl manual speed, and amount of shape air. Touching an arrow button once will cause the rate to increase/decrease by one percent. Continued pressure on the button does not change the rate by more than one percent.
- **Reference Values**. These fields, located on the bottom right section of the screen, show the current system pressure and flow for reference.
- **Learn Volume.** This button, located on the lower left section of the screen, is used to determine the Process Volume for a selected style. Touching Learn Volume while Dispense Mode is Auto will cause the PrecisionFlo Plus to save the last calculated volume as the Process Volume for the selected style. The resulting value is displayed on the overview screen (Overview) and is used as the reference on following jobs. The Process Volume parameter can also be manually set/adjusted on the Volume Parameters screen (Setup→PrecisionFlo Plus→Volume Parameters)**.**
- **Dispense Gun 1, Dispense Gun 2, and Dispense Guns 1 & 2** These manual dispense buttons, located below the Learn Volume button on the lower left section of the screen, are used when Dispense Mode is Manual. All three buttons will be displayed only if the system is configured for two-gun operation (Setup→Display Options); otherwise, only **Dispense Gun 1** is shown. Touching these buttons will cause the system to dispense material as long as the button is held down. Letting the button go will stop the manual dispense.

# PrecisionFlo Plus Settings Screen

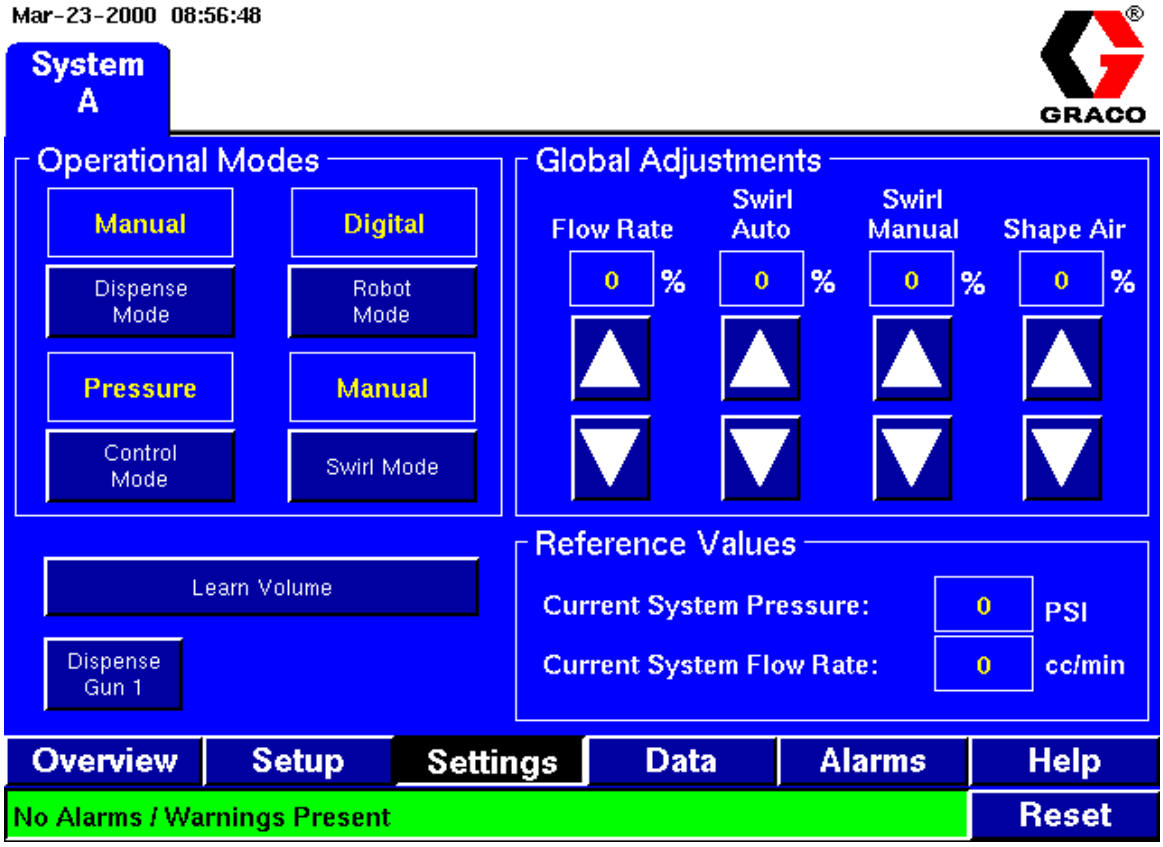


Fig. 25

# Data Screen

The TouchScreen application writes a record to a data log for each complete job. The current and previous data logs can be viewed on the Data screen (Fig. 26). To access the Data screen touch the **Data** button.

Each data log entry includes:

- Job end date. This is the date the job completed, in the format MMM-NN-YYYY, where 'MMM' is the three-letter month abbreviation, 'NN' is the day of the month, and 'YYYY' is the four-digit year. For example, a job ending on April 12, 2000 would have a date logged as Apr-12-2000.
- Job end time. This is the time the job completed, in 24-hour format HH:MM:SS, where HH is the hour of the day, MM is minutes, and SS is seconds. A time of 15 minutes and 34 seconds after one o'clock in the afternoon would be logged as 13:15:34.
- The job number. At the start of each day (midnight), the job number is set to one for the first job. The job number counts up from there, incrementing by one for each successive job. If the PrecisionFlo Plus is powered off and restarted that same day, the job number counter will take up where it left off.
- Style name. This is the user-assigned name given to the chosen style from the Volume Parameters screen (Setup→PrecisionFlo Plus→Volume Parameters).
- Job material volume data.
- Process Volume – The volume entered for the style of the dispense job.
- Calculated Volume – The total volume requested by the robot. This is derived from an integral of the robot flow command during a dispense job.
- Measured Volume – The difference between the measured volume and the calculated volume.
- Percent Error
- Job status. A brief message as to whether or not the job completed successfully will appear here. If not successful, this will be an error message.

The data log file is stored internally as a tab-delimited text file. TouchScreen limits the physical size of the file to be less than the storage capacity of a single 1.44MB floppy disk. For this reason, over a month's time (and depending on the number of jobs completed), it is very likely that multiple data logs will be generated. To distinguish between a given month's data log files, each file is assigned a letter, starting with 'A', and successively incrementing to 'B', 'C', and so on as necessary. This letter is indicated in the name of the file itself.

The internal file name of each data log file has the following format: sMMYYYYn.log, where 's' is the system letter, 'MM' is the month number, 'YYYY' is the four-digit year, and 'n' represents a specific log file within a one-month time period. As an example, the first three data log files for System A during the month of April, 2000 would be named a042000a.log, a042000b.log, and a042000c.log. The name of the log file currently being displayed is shown at the top of the screen.

The buttons to the right of the data log viewing area are used to switch between existing data log files. Touch **Previous Archive** to view past data log files. Touch **Next Archive** to view successively newer files, up to the current log file. Touch **Current Archive** to immediately return to the current data log file.

Touching and dragging on the vertical slider bar will scroll through the file contents down. Alternatively, touching the up and down arrows will move up or down one record at a time.

**NOTE:** If a job finishes while the Data screen is being displayed, the view will not automatically update to show the just-completed-job's entry. The job does get recorded to the file, but the view does not automatically reflect this. To update the view, press Current Archive.

The data logs can be retrieved from the TouchScreen for further analysis. Two methods of doing this are available—by floppy disk (page 14) or by using FTP over an Ethernet connection (Appendix A).

# Data Screen

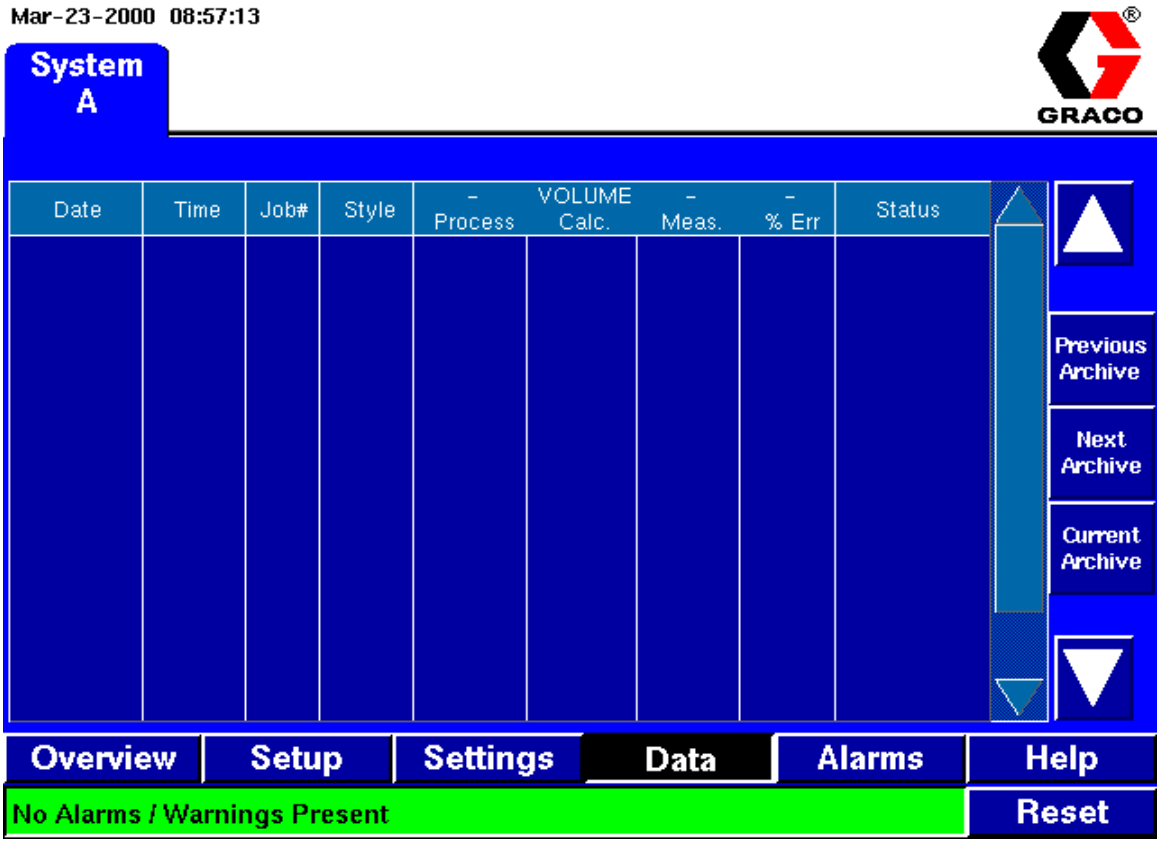


Fig. 26

# Alarms Screen

The Alarms screen (Fig. 27) contains the alarms log which records each fault condition experienced by the PrecisionFlo Plus Module. The log also contains a record to show when the fault condition was cleared. Fault conditions are either alarms or warnings. To access the Alarms screen touch the **Alarms** button.

Each alarm log entry includes:

- Date – The date on which the entry was logged. Has the same format as the date used in the data log.
- Time – The time at which the entry was logged. Has the same format as the time used in the data log.
- Module – At the time of this writing, this is always ”PrecisionFlo Plus”.
- Fault – The fault number associated with the fault condition. See Graco manual 310558 for the complete list of faults, fault numbers, and descriptions.
- Description – A very brief description of the fault condition.
- Status – Indicates whether the alarm log entry corresponds to detecting or clearing the fault.

The alarm log file is stored internally as a tab-delimited text file. TouchScreen limits the physical size of the file to be less than the storage capacity of a single 1.44MB floppy disk. For this reason, over a month’s time (and depending on the number of faults experienced), it is very likely that multiple alarm logs will be generated. To distinguish between a given month’s alarm log files, each file is assigned a letter, starting with ‘A’, and successively incrementing to ‘B’, ‘C’, and so on as necessary. This letter is indicated in the name of the file itself.

The internal file name of each alarm log file has the following format: sMMYYYYn.flt, where ‘s’ is the system letter, ‘MM’ is the month number, ‘YYYY’ is the four-digit year, and ‘n’ represents a specific log file within a one-month time period. As an example, the first three alarm log files for System A during the month of April, 2000 would be named a042000a.flt, a042000b.flt, and a042000c.flt. The name of the alarm file currently being displayed is shown at the top of the screen.

The buttons to the right of the alarm log viewing area are used to switch between existing alarm log files. Touch **Previous Archive** to view past alarm log files. Touch **Next Archive** to view successively newer files, up to the current alarm file. Touch **Current Archive** to immediately return to the current alarm log file.

Touching and dragging on the vertical slider bar will scroll through the file contents. Alternatively, touching the up and down arrows will move up or down one record at a time.

The alarm logs can be retrieved from the TouchScreen for further analysis. Two methods of doing this are available—by floppy disk (page 14) or by using FTP over an Ethernet connection (Appendix A).

# Alarms Screen

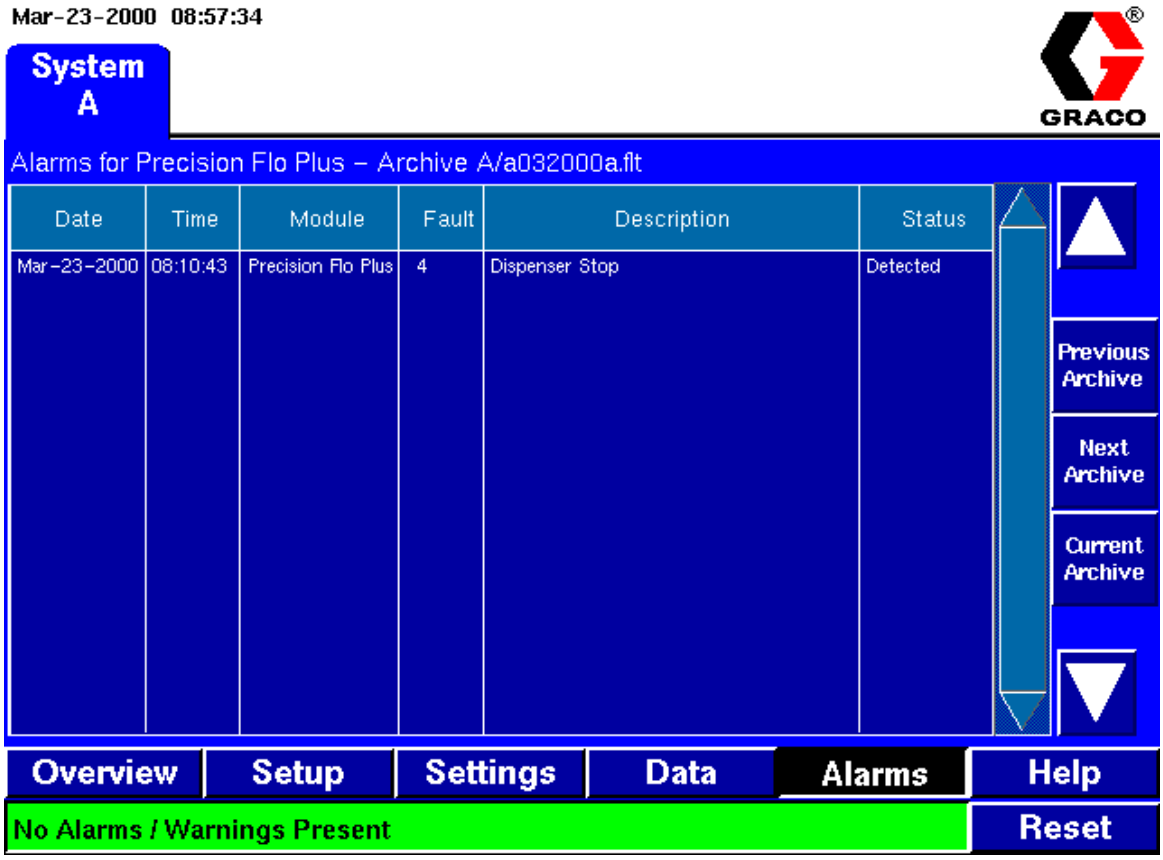


Fig. 27

# Help Screen

The Help screen displays:

- A page of text from the online instruction manual.
- A scroll bar that is used to move through the file.
- The name of the system from which data was retrieved. For example: System A, System B, System C, etc.
- The TouchScreen control buttons.

To access the Help screen:

1. Touch **Help** to display the Help screen, which contains the fault code table and the alarms code table.
2. Use the scroll bar to move through the file.

If **Help** is touched while a fault is active, more information about that specific fault is displayed. If no fault is active, the online manual table of contents is displayed. The online manual contains hyperlinks allowing the operator to touch a topic to display the desired information.

# Notes

# Appendix A
# Ethernet and FTP

This Appendix describes how to connect a laptop computer to the PrecisionFlo Plus to transfer alarm and data logs and system settings files from the PrecisionFlo Plus to the laptop. A laptop is referred to throughout this appendix, but a nearby workstation or desktop computer would work just as well. This method is an alternative to transferring files using the floppy disk drive.

**NOTE:** This appendix assumes that the Ethernet communication accessory kit (Graco part number 241798) has been installed. This accessory is not installed by default. For installation instructions, please see Appendix A in Graco manual 310558.

The procedure on page 14 describes how to transfer alarm and data log files, as well as system settings files, from the PrecisionFlo Plus to a floppy disk. The floppy disk file transfer functionality is intended to allow the operator to take the floppy disk containing the log files to a personal computer in an office setting for further analysis and/or archiving. The procedure outlined in this Appendix replaces the step of transferring files to a floppy disk with transferring them directly to another computer.

**NOTE:** This appendix is written for users with basic knowledge of personal computers and Microsoft Windows, as well as some familiarity with general networking concepts. Because the successful implementation of networking multiple computers together requires proper setup and configuration on all computers involved, you may need to contact your company's IS department (or equivalent) for assistance.

**NOTE:** Today, Ethernet, TCP/IP, and FTP are technologies in wide use on the Internet, in offices, and in manufacturing facilities. Depending on implementation, they can be used for many different purposes. Graco's implementation of these technologies in the PrecisionFlo Plus, at the time of this printing, is to use it simply as an alternative file transfer mechanism.

This appendix does not attempt to explain in detail how Ethernet, TCP/IP, and FTP work, but you should have a basic, high level understanding of how they work to understand the concepts and steps presented.

**Ethernet**

Ethernet is a very common type of communications network. Not to be confused with the term Internet (which is a very large number of small and medium sized computer networks all linked together to form one large network), Ethernet is a standard that defines the physical and electrical characteristics (some low-level software characteristics, too) of a specific type of computer network. An Ethernet network uses a star or bus topology and supports multiple types of cabling media. The PrecisionFlo Plus conforms to IEEE Standard 802.3, a widely used specification that was established to standardize Ethernet networks.

Two common media types used in Ethernet networks are:

1. 10BaseT – Twisted pair cables that use RJ45 connectors. Most commonly used in office settings, these cables can be used for runs up to 100 meters. Generally used in networks with a star topology, which requires the use of a network hub. No termination resistors are required. Also known as Category 5 communication cable, or simply Cat 5 cable. See Fig. 28 for an example.

2. 10Base2 – 50 ohm RG58 coaxial cable. These cables use T connectors for each network connection in a trunk line / drop line configuration. Each end of the network requires a 50 ohm resistor. Cable runs can be up to 185 meters long. This is most commonly used in industrial, non–office environments. This is the type of media the PrecisionFlo Plus is designed to use. Also known as "thinnet" cable. See Fig. 29 for an example.

Both of these media types support 10 Mbaud (10 million bits per second) communication rates. A short length of either of these cables, with connectors installed on both ends, is commonly called a patch cable.

# Appendix A
# Ethernet and FTP

Fig. 28

Fig. 29

# Appendix A
# Ethernet and FTP

### TCP/IP

The acronym, TCP/IP stands for Transmission Control Protocol/Internet Protocol. It is a suite of communication protocols widely used in Ethernet networks all over the world. One of its main functions is to route packets of information from one computer to another. This is accomplished by assigning every computer on the network a unique IP address, which has the format nnn.nnn.nnn.nnn, where 'nnn' is a number between 1 and 254. While the specifics are beyond the scope of this manual, in general the address is made up of two parts. One part designates the network itself and the other part that uniquely identifies the computer (also called a 'host') on the network. On a computer network where two (or more) computers are communicating using TCP/IP, all computers involved must have addresses that have the same network identifier but unique host identifiers.

The default address used on the PrecisionFlo Plus is 192.111.223.110. The network portion of the address is 192.111.223 and the host portion is 110. Any other computer connected to the same physical network as the PrecisionFlo Plus must use an address like 192.111.223.nnn, where nnn is any number between 1 and 254, except 110.

Your company may have specific standards or regulations regarding the use of IP addresses. To change the IP address of the PrecisionFlo Plus to accommodate these standards, contact your Graco sales representative for assistance.

### FTP

FTP is an acronym for File Transfer Protocol. It is a very popular communications protocol designed specifically to transfer files between computers.

### What is Needed?

To properly set up communications, there are two basic parts to deal with—the installation/configuration of software and the physical network connection itself. The PrecisionFlo Plus is fully configured at the factory and no software configuration or modification is required. Therefore, the software part involves configuring the network settings on the laptop. Both the network settings and physical connection are discussed below.

### Network Settings on the Laptop

**NOTE:** Companies have varying policies on who is allowed to modify parameters such as network settings. Check with your IS department for approval before going ahead with the steps below. The procedure shown illustrates the steps for Windows 98; other Windows platforms will be similar.

In Windows 98, click on Start→Settings→Control Panel. When the Control Panel appears, double-click on the Network icon. A dialog box pops up. In the list displayed at the top, there should be a line representing the physical network card (also called network adapter) installed on your computer. For example, "Network of Xircom CreditCard 10/100+Modem 56" (see Fig. 30). Further down in the same list, there should be another line that indicates the TCP/IP protocol is installed. For example, "TCP/IP→ Network of Xircom CreditCard 10/100+Modem" (see Fig. 31). Select the "TCP/IP → Network of …" line and click on Properties. Another dialog box should pop up; select the IP Address tab. Select "Specify an IP address" and fill in the blanks as shown in Fig. 32. If you prefer, the last number of the IP address can be something different (see previous explanation of TCP/IP). The rest of the tabs on this dialog box can be left as they are. Click OK to close this dialog box. Click OK to close the first dialog box. You will get a message from Windows stating that you need to reboot for the changes to take effect. Reboot the computer.

If a network card or the TCP/IP protocol has not been installed, consult the documentation that came with your network card for installation instructions.

# Appendix A
# Ethernet and FTP

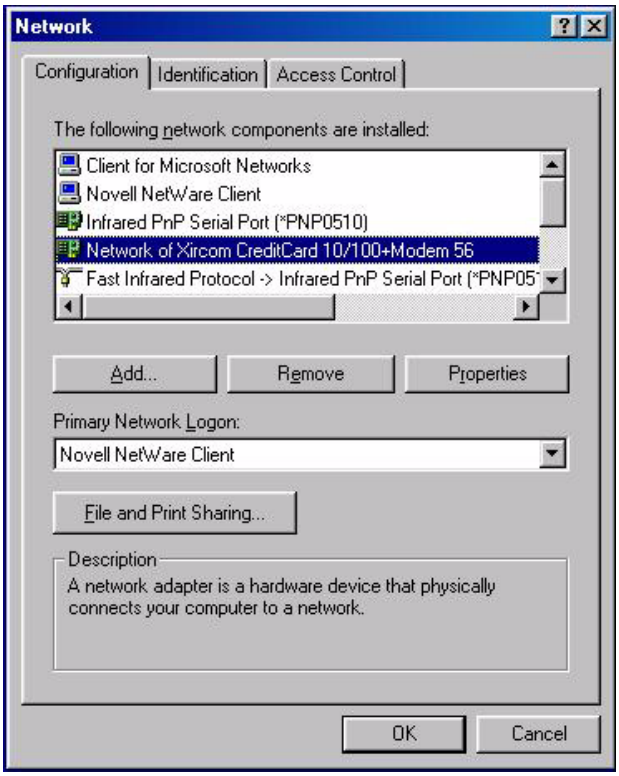


Fig. 30

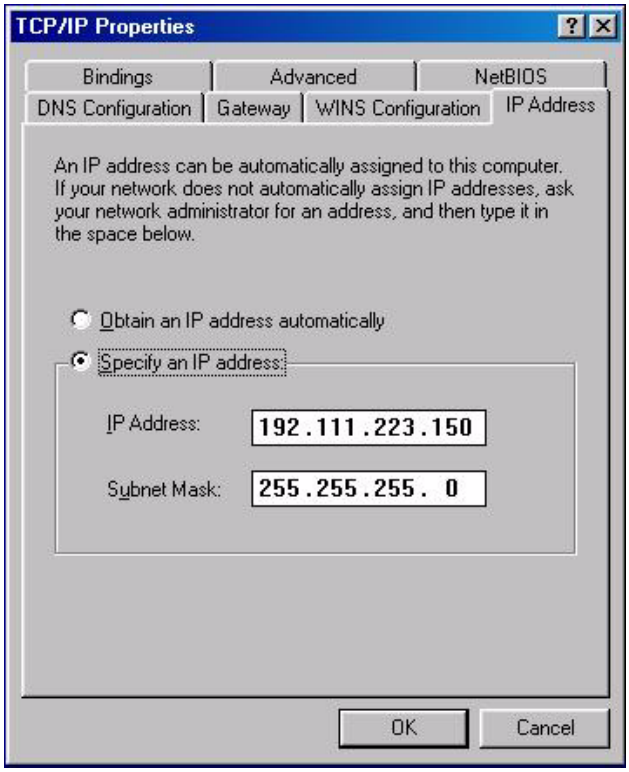


Fig. 32

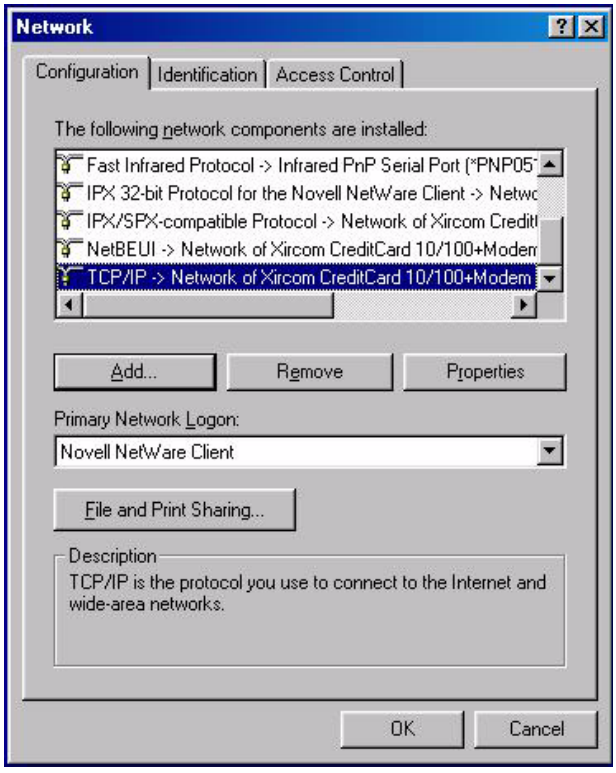
Network
Configuration
Identification
Access Control
The following network components are installed:
Fast Infrared Protocol -> Infrared PnP Serial Port (*PNP05
IPX 32-bit Protocol for the Novell NetWare Client -> Netwo
IPX/SPX-compatible Protocol -> Network of Xircom Credit
NetBEUI -> Network of Xircom CreditCard 10/100+Modem
TCP/IP -> Network of Xircom CreditCard 10/100+Modem
Add...
Remove
Properties
Primary Network Logon:
Novell NetWare Client
File and Print Sharing...
Description
TCP/IP is the protocol you use to connect to the Internet and wide-area networks.
OK
Cancel

Fig. 31

# Appendix A
# Ethernet and FTP

**Making the Physical Connection to the PrecisionFlo Plus**

There are two common ways to connect to the PrecisionFlo Plus. The first way involves using a 10Base2 cable to directly connect the two computers. The second way, needed if your laptop doesn't have a 10Base2 connector, is to use a network hub, a Cat 5 patch cable, and a 10Base2 cable.

The easiest way to connect to the PrecisionFlo Plus is the first method mentioned above, using a 10Base2 cable. Connect one end to the bulkhead connector on the PrecisionFlo Plus and the other end to the BNC connector on your external Ethernet cable on your laptop (see Fig. 33).

If your laptop doesn't have a 10Base2 connector, you can also use a network hub. This configuration, while functional, is significantly more cumbersome for a temporary connection. Connect a Cat 5 patch cable to your laptop and the other end to an available hub port. Connect a 10Base2 patch cable (with a T and 50 ohm termination resistor on both ends) from the BNC connector on the hub to the BNC connector on the PrecisionFlo Plus. Apply power to the hub (see Fig. 34).

**Fig. 33**

**Fig. 34**

# Appendix A
# Ethernet and FTP

### Anybody Home?

A quick test to try when everything is powered up and plugged in is the ping test. The ping test uses a utility built into Windows called ping.exe. Ping.exe sends an "Are you there?" message to another node on the network. If the message gets to the other node and it's up and running, it will return the message to the sender. To try this, open a DOS window and type:

```
c:\ping 192.111.223.110
```

Use the appropriate IP address if you have changed it from the default. If the laptop is configured correctly and the physical connections are OK, you will see something like:

```
Pinging 192.111.223.110 with 32 bytes of data:

Reply from 192.111.223.110: bytes=32 time=1ms
 TTL=255
Reply from 192.111.223.110: bytes=32 time<10ms
 TTL=255
Reply from 192.111.223.110: bytes=32 time=1ms
 TTL=255
Reply from 192.111.223.110: bytes=32 time<10ms
 TTL=255

Ping statistics for 192.111.223.110:
Packets: Sent = 4, Received = 4, Lost = 0
   (0% loss),
Approximate round trip times in milli-seconds:
  Minimum = 0ms, Maximum = 1ms, Average =  0ms
```

On the other hand, if it's not set up right, you'll see something like this:

```
Pinging 192.111.223.110 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.111.223.110:
Packets: Sent = 4, Received = 4, Lost = 0
  (0% loss),
Approximate round trip times in milli-seconds:
  Minimum = 0ms, Maximum = 1ms, Average =  0ms
```

If you see the latter, do not continue the test. If the ping test doesn't work, FTP will not work either. There are various possible causes for ping test failure. Some things to check are:

1. Double-check the physical network connections.

2. The green link LED on the laptop's external network card connector should be on.

3. Try pinging the laptop—from the laptop. That is, on the laptop, type "ping <IP address>", where <IP address> is the IP address of the laptop. If this doesn't work, the network configuration isn't right.

4. Double-check the IP address settings on the laptop.

Two very common causes of problems are invalid network settings on the laptop or a faulty cable.

### Transferring Files

The laptop must have an FTP client software package installed on it. There are several FTP packages available, some that are very easy to use. A default Windows installation includes an FTP client called ftp.exe. Unfortunately, this particular utility is not very user-friendly. For this reason, instructions to create a batch file to do the necessary FTP commands for you are shown below.

Automate ftp.exe by creating the two following text files:

getlogs.bat:

```
ftp –s:logs.txt %1
```

logs.txt:

```
pfloftp
pfloftp
cd /home/cpflo/data/log/A
prompt
ascii
mget *.log
mget *.flt
mget *.pcc
bye
```

**NOTE:** Be sure to enter the text *exactly* as shown above. A single typo will cause the operation described below to fail.

Next, create a directory to be used for the file transfer. For the purposes of this example, we'll use c:\graco. Move the getlogs.bat and logs.txt files created above into this directory. Open a DOS window and change working directories to c:\graco. At the command prompt, run the batch file:

```
c:\getlogs 192.111.223.110<Enter>
```

# Appendix A
# Ethernet and FTP

The .bat file will invoke the FTP utility, pass the IP address entered on the command line to it, and execute the commands listed in the logs.txt file. The commands will instruct the FTP utility to fetch a copy of all the alarm and data logs from the PrecisionFlo Plus and put them in the current directory on the laptop.

The commands in logs.txt will fetch a copy of the log files from the PrecisionFlo Plus. The original files will still reside on the PrecisionFlo Plus and will not be deleted. Internally, the PrecisionFlo Plus has over a gigabyte of hard disk space to store log files on. If there is concern about the hard disk filling up, the logs.txt file can be modified to delete the originals after the transfer. To accomplish this, add the following two lines to logs.txt, just before the final “bye” command:

```
mdelete *.log
mdelete *.flt
```

See pages 30 and 32 for more information about alarm log and data log file naming conventions.

**Suggested vendors:**

Networking cables:
MicroWarehouse
www.warehouse.com
1–800–397–8508

#DCA1196 – 10’ Thinnet
(coax) patch cable (other lengths available)
#DCA1604BK – 7’ black Cat 5 patch cable (other lengths available)

Network adaptors and hubs:
SMC
www.smc.com
1–888–838–9247

For laptops:
#SMC8022BT, EZ PC Card 10

For desktops:
#SMC8416BTA, EtherEZ 10, ISA bus
#SMC1208BT, EZCard 10, PCI bus

Hubs:
#SMC3608T–EZ, EZ Hub 10, 8–port RJ45 with BNC

Network adaptor:
Xircom
www.xircom.com

For laptops:
Xircom CreditCard Ethernet
10/100+Modem 56, with #CABLE–ETH212

# Notes

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This warranty does not cover, and Graco shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non–Graco component parts. Nor shall Graco be liable for malfunction, damage or wear caused by the incompatibility of Graco equipment with structures, accessories, equipment or materials not supplied by Graco, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by Graco.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized Graco distributor for verification of the claimed defect. If the claimed defect is verified, Graco will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor, and transportation.

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**GRACO INC. P.O. BOX 1441 MINNEAPOLIS, MN 55440–1441**
**www.graco.com**
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